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International corporations and profit shifting in Norway

Under the post 2006 tax regime

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Abstract

Previous studies have found clear differences in profitability between Norwegian and multinational firms operating in Norway under the dual income tax systems prior to 2006. It is corporations that only operate in Norway that is found to be the most profitable, which suggests profit shifting by international firms. One problem with these studies is that none of them account for the fact that in some circumstances, it would be preferable for owners who also are employed in the same corporation to receive labor compensation as dividends rather than wages. I try to control for this in my estimation on data between 2006 and 2011. I find that profitability in corporations where the chairman of the board also is the CEO is higher, and like in previous studies I find a lower profitability in foreign controlled firms. Surprisingly however, I find no differences in profitability between domestic Norwegian and Norwegian multinational corporations.

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1. Introduction

In the past 12 months there have been several revelations in British media with regards to multinational companies and the lack of their taxable income. In Britain, considerable attention has been given to both Starbucks and Google during the fall and winter of 2012. A four month investigation by Reuters published on bbc.co.uk revealed that Starbucks has only paid £8.6 million in income taxes since its establishment in the UK in 1998, of a turnover of more than £3 billion in the same period (Bergin, 2012). According to The Independent, Google Chairman Eric Schmidt is proud of his company's tax avoidance scheme, calling it "capitalism" (Kumar & Wright, 2012). The same article also states that Google sheltered £11 billion pounds of its revenue in Bermuda in 2011, a known tax haven.

Numbers published by the Norwegian Tax Administration on nrk.no, *Skatteetaten*, reveals that 6 out of 10 corporations operating in Norway did not pay tax in 2011 due to either zero or negative taxable profit (Sættem, 2013). Skatteetaten also reported that an estimated 29 billion NOK has been wrongfully withheld from taxation by corporations operating in Norway (Tomter, 2013). Half of this amount is estimated to be from internal sales between companies across borders. Though corporations in Norway are no less susceptible to profit shifting than British corporations, few have been singled out like in Britain. Leftist newspaper Klassekampen published an article on the 25th of January 2013 naming 5 large corporations that paid little or no taxes in Norway for the financial year 2011 (Ekeberg, 2013).

During the previous three decades, the information age and globalization has connected the world's nations in trade. Since 1980, the volume of trade has increased more than ten times, measured in global exports in US dollars at today's value, according to the World Trade Organization (WTO, 2013). With the increase in trade came the increase in multinational corporations. According to the *UN Conference On Trade And Development* (UNCTAD) there were 35 000 transnational corporations (TNCs) with more than 150 000 affiliates in 1992 (UNCTAD, 1992). In 2009, this number has increased to 82 000 TNCs and more than 800 000 affiliates. (UNCTAD, 2009)

Each TNC thus has an average number of affiliated companies just shy of 10. As the designation *Transnational Corporation* indicate, some of these affiliates are located in a different country than the parent unit. One of the largest TNCs, General Electric, is present

in more than 150 countries according to the facts sheet on the corporation's webpage. When a corporation has a corporate structure spread over several nations, the opportunity for profit shifting exists. Some of the countries a TNC is located in will have a higher tax rate than others. By shifting the profit from affiliates in high-tax countries to affiliates in low-tax countries, TNCs can improve financial performance and return to their shareholders.

Neither Norway nor Britain has a particularly high corporate tax rate. In Norway, the corporate tax rate is 28%, and in Britain it is between 20% and 24%. Compared to the Bahamas however, where the corporate tax rate is 0%, one realizes that incentives for profit shifting exist in both countries. The popularity of tax havens such as the Bahamas is further underlined by a report by the US Public Interest Research Group from April of 2012. The report states that 83 of the 100 largest publicly traded US corporations maintain revenues in tax havens, as of 2008. According to the same report, congressional studies suggests that $60 billion USD in taxable revenue is annually placed in tax havens by US corporations.

There are two main strategies for corporate profit shifting from high-tax countries to low-tax countries. The first is to finance the subsidiaries in countries with a high tax rate with debt from the parent corporation or other subsidiaries, while keeping equity in low tax countries. This strategy is generally referred to as thin-capitalization (Russo *et al.* 2007, pp 108). In several countries, among them Norway, interest costs are tax deductible. By financing an affiliate with debt rather than equity, the parent company retains a larger part of the affiliate's earnings before taxes.

Several of the OECD countries have imposed restrictions that limit capital structure, and deny tax deductions of interest on intra-company debt if the capital structure exceeds certain limits. Norway has no specific laws limiting thin-capitalization (PWC, 2012, pp 627-639), though there is legal precedence on thin capitalization in certain sectors (Schjelderup, 2012). This is likely to change in the future. Prime Minister Stoltenberg announced in a speech May 1st. that the government would seek to limit tax deductible interest costs if the debt is internal. A study by Buettner *et al.* (2006) finds that an increase in tax rate of 10% results in a corresponding increase in leverage ratio (debt to total assets) of between 3.4 and 4.4 percentage points. The same study also found that in countries that limit capital structure the leverage ratio of firms is about 5 percentage points lower.

The second method and the object of study in this thesis is the internal transfer pricing in corporations across borders. A corporation can increase its profits by charging a higher internal transfer price to a subsidiary located in country with a higher tax rate than the parent corporation. As most costs are tax deductible, a high transfer price will reduces the taxable profit for the affiliate in a high-tax country. The difference between the artificial and actual transfer price is then taxed in a low-tax country.

Both Norway and OECD have similar guidelines governing the internal transfer of goods and services across borders. All prices of internal transfers in Norway and in OECD are subject to the so-called arm´s length principle ("ALP", Skatteloven §13-4, Regnskapsloven §4-1). This principle requires that transactions between related parties are comparable to documented transactions between unrelated parties. While this principle should in theory put a limit to artificial high or low transfer pricing, strict application of the principle is often impossible (Bartelsman & Beetsma, 2003).

For instance, there are no comparable prices for many internal transfers. This is often true for licenses to use intellectual property such as patents and brand name belonging to the parent corporation. In a world characterized by liberal markets, intangibles as mentioned above are important to sustain a competitive advantage. A specialized knowledge-intense asset with no other applications and users other than the intended buyer of the asset may also prove difficult to price fairly. An example of such an asset could be subsea drilling equipment custom made to interact with other firm specific equipment.

It should come as no surprise then that some member countries of OECD already acknowledge the shortcomings of the arm's length principle. According to NTB, in an article published on dn.no in February, 2013, the ministers of finance in Britain, France and Germany called out for new coordinated international initiatives to combat corporations shifting profits across borders. General Secretary of OECD, Angel Gurria, underlines that the practice is within the limits of the law, calling for changes to the law (NTB, 2013).

Though legal, many consider the method of which multinational corporations shift profits abroad to be unfair. Local corporations may be competing for financial investments with an international corporation with a parent in a tax haven. All else equal, investors will prefer to invest in the corporation in the tax haven. Nations are also competing for corporate revenues, indicated by the falling corporate tax rates of OECD in the previous decades.

2. Methods in literature

Taxation of corporations has been studied for as long as corporations have been taxed. There are countless of studies conducted in different countries (Devereux, 2006). To determine if corporations profit shift there are in general two approaches; the direct and the indirect method.

2.1 The direct method

The direct method is comparing the prices of internal sales in multinational corporations to sales between independent parties. If it is found that the internal transfer price is different from the price in a transaction between independent parties, it may be reasonable to assume that this could be for tax purposes.

One study using the direct method is Bernard *et al.* (2006), who use data from US customs consisting of US exports from 1993 up to and including 2000. Exporters in the US must declare whether the export is to an unrelated party at arm's length, or if the transaction is between related parties. This gives the authors a set of data where it is possible to match firms and products, and compare prices when goods are exported to unrelated and related parties. Bernard *et al.* (2006) found that the average arm's length prices are 43 percent higher than the related price. This indicates that multinational corporations are shifting profits away from the US by exporting goods cheaply to affiliates abroad; thereby reducing the taxable income in the US based affiliate. The authors further finds that the difference in transfer prices is larger for differentiated goods than standardized goods. Arm's length transactions are priced 66.7% higher than for related parties when exporting differentiated goods. For standardized commodities the gap is "only" 8.8%.

While the direct method may be the most precise method when trying to determine if corporations shift their profits to low-tax countries, data may be hard to come by. First of all, corporations that knowingly alter their internal transfer prices will not give up their reasoning behind the difference in prices unless ordered to do so by law or investigative authorities. Second, several internal transfers are specific to the organization, meaning that alternative use and market prices outside of the organization may be difficult or impossible

to find. Due to limited data being available, there are not many studies where the direct method is used (Balsvik *et al.* 2009).

2.2 The indirect method

Unlike the direct method, data for the indirect method is easier to compile and get access to. All necessary data can be found in financial statements combined with other publicly available sources. An example of the indirect method is to measure the profitability, or taxable income of a corporation in relation to turnover explained by a set of variables. This set of variables will include factors that are believed to affect profitability, including variables that distinguish multinational from domestic firms. The idea is to control for as many factors as possible. The remaining unobserved difference in profitability between domestic and foreign firms will then be captured by the coefficient of the group variable indicating foreign or multinational firms. A negative coefficient for either group could indicate profit shifting.

One of the earliest studies using the indirect method is "*Explaining the Low Taxable Income of Foreign Controlled Companies in the United States*" by Grubert *et al.* from 1993. The authors use a panel of US firms between 1980 and 1987 to find observable significant characteristics that influence the profit margin of firms. The remaining unobservable difference in profit between multinational and domestic corporations is said by the authors to be the upper bound of profit shifting. Grubert *et al.* find that 50% of this difference can be attributable to special characteristics of foreign controlled corporations, not transfer pricing. An improved study by Grubert (1997) improves the model specification and utilizes newer data. In this study, Grubert concludes that up to 75% of the profitability differential can be explained by systematic differences between multinational and national corporations.

2.3 The unobserved profitability difference

Even though previous literature find profitability differences between domestic and international firms using the indirect method, it's far from certain exactly to which extent corporations shift income. The profitability differential is unobserved, and thus it may be a result of other factors. For instance, expansion is expensive. Especially this holds true for international expansion, and corporations run the risk of a failed expansion (Contractor *et al*,

2002). Development and execution of the strategic plan must be of the highest level in order to ensure international success, which can be costly. Few corporations enjoy immediate international success. Like for any investment, much of the costs connected to internationalization are realized at the start of the project, while the income usually is realized later (Contractor *et al*, 2002). This fact may influence profitability of multinational corporations in an expansion phase, or corporations that become multinational in the analysis period.

This should then also hold true for international corporations expanding to Norway. The Norwegian affiliate may suffer from a low profitability in the startup phase. Norwegian corporations acquired by foreign enterprises may also experience a fall in profitability. Restructuring such as rebranding, reeducation of employees and replacing leadership are factors that are costly, but which may be necessary in a newly acquired affiliate. Kinney and Lawrence (2000) suggest that corporations that are subject to a foreign takeover are less operationally mature and suffer from higher startup costs and low revenue typical for new businesses. Balsvik and Heller (2009) find that foreign acquisitions in Norway typically are of firms in growth, contradicting the hypothesis of Kinney and Lawrence (2000). Still, one-time costs in relation to the acquisition must be expected, and thus may influence profitability of corporations that recently have become foreign controlled.

Additionally, profit shifting between affiliates may not always be solely for financial gain. Bergstrand (2009) argues there may be other reasons to why the internal transfer price may be different between different subsidiaries, such as creating financial incentives for managers and profit sharing between the consolidated divisions. Devereux and Keuschnigg (2009) further argue that a corporation in a high tax country may pay high transfer prices in order to increase the free cash flow of an affiliate, as having a high free cash flow increases the availability of external financing for the affiliate. The authors claim that transfer prices serves an important function to coordinate production units in multinational corporations, and thus are not merely a tool for tax minimization. Practices such as these however are not allowed by the arm's length principle of OECD.

Due to the nature of this difference, it is not possible to estimate how much of it is caused by profit shifting. It could possibly be caused by other factors, as described above. Profit shifting does however remain a likely explanation, at least for some of the unobserved difference. Nearly every scientific research project thus far finds profitability differences

between international and domestic firms. Some larger firms do not even hide the fact that they shift profit between nations, which gives the impression that profit shifting is a common occurrence, especially in large firms. Finally, it is important to keep in mind that most of these practices are in fact legal. Internal transfer prices should be set according to the arm's length principle. Due to the difficulties in pricing intangibles and specialized equipment however, managers often have discretion to set the transfer prices as they wish.

2.4 Studies on profit shifting and tax levels

Several studies have shown that differences in profitability between domestic and multinational firms depend on the different tax levels the corporation and its affiliates face. Harris *et al.* (1993) found that US corporations with affiliates in low tax countries pay less tax than comparable corporations with affiliates in high tax countries. Klassen *et al.* (1993) conducted a similar study, where they analyzed profit shifting by multinational corporations in response to changes in corporate taxes between 1984 and 1990. Their conclusion is that income shifting can be related to the corporate tax rates and changes in it in different nations.

Harris (1993) also concludes that flexible, or intangibles intensive corporations shifted income to the US after the Tax Reforms Act of 1986. Dischinger and Riedel (2011) find evidence for their hypothesis; that multinational corporations place and/or develop intangible assets in research centers located in low-tax countries. This is profitable as it allows the affiliate in the low tax country to expensively license intellectual property to other affiliates. The authors name Vodafone as an example of a corporation which has relocated its intangibles to a subsidiary in Ireland, a country with low corporate taxes. Dischinger and Riedel (2011) argue that this pattern is driven by two motivations; to save taxes on intangibles, and to move income from production centers in high-tax locations by pricing intangible input factors artificially high.

2.5 Studies conducted in Norway

In Norway there have been two large studies about multinational corporations and profit shifting. Both aim to determine the difference in tax between international and domestic corporations by using the indirect method. In a historical perspective, the Norwegian tax rate has been quite low compared to their OECD trading partners. As such, one would expect that

some corporations would find it profitable to shift profits to Norway rather than out of the country (Balsvik *et al.*, 2009). Both of the Norwegian studies do however find that foreign controlled corporations have a lower taxable income to sales ratio than domestic firms.

The first of these two studies is Langli and Saudagaran's "*Taxable income differences between foreign and domestic controlled corporations in Norway"* from 2004. The study uses a sample of small and medium sized Norwegian firms in the manufacturing and wholesale sectors, from 1993 to 1996. The authors find that after controlling for start-up costs, size, industry affiliation, leverage and capital intensity, there is a difference in tax between foreign controlled (FCC) and domestic controlled corporations (DCC). Descriptive statistics indicate that DCCs have a profit margin of 4.8% while FCCs have a profit margin of 2.1%, a difference of 2.7 percentage points. In their OLS regression model, the authors estimate this difference to be 2.6 percentage points or similar to the descriptive analysis, indicating profit shifting by the FCCs.

To check the robustness of their estimation, the authors also attempt to scale taxable income to assets or the book value of equity, without finding evidence contrarily to their conclusion. Langli and Saudagaran (2004) claim that their conclusion is unlikely to be attributable by the dominance of DCCs in the sample, or lack of control variables. One problem with this study however is as Balsvik *et al.* (2009) also point out; Langli and Saudagaran (2004) do not control for the fact that some of the DCCs in their sample may have a foreign affiliate, and thus have the same opportunity to profit shift as the FCCs. One can hardly argue that Norwegian owners are less susceptible to profit shift than foreign owners. This problem is not addressed by Langli and Saudagaran, thus their estimated difference of 2.6 percentage points could quite possibly be negatively biased.

The problem is however addressed in the second major study in Norway, *"Kunnskapsstatus for hva økonomisk forskning har avdekket om flernasjonale selskapers internprising i Norge"* by Balsvik, Jensen, Møen and Tropina from 2009. The authors of this report control for foreign Norwegian affiliates, and include other sectors than manufacturing and wholesale. Additionally, the dataset contains observations over a longer period of time, from 1993 to 2005.

While the authors are unable to replicate the results of Langli and Saudagaran (2004), they find the difference in taxable income to turnover ratio between multinational and national

corporations to be 1.6 percentage points in the period 1993-1996. Like Langli and Saudagaran however, the authors find that it is the foreign controlled corporations that are the least profitable. Even when Balsvik *et al.* (2009) include the additional years of data they have available in their analysis and control for firm specific effects, the coefficient do not change much. Using their whole sample, the authors find a coefficient of 1.64 percentage points, which indicates a stable difference in profitability between multinational and Norwegian firms in the retail and manufacturing sector.

Balsvik *et al.* (2009) additionally expands their analysis to include other sectors than those found in Langli and Saudagaran (2004). When excluding firms in the petroleum and extraction sectors the authors finds a difference in taxable income to turnover ratio of 3.93 percentage points using OLS and 2.38 percentage points when controlling for firm specific effects. Interestingly the authors find that profitability differences also are sector dependent. The largest difference is found in the finance, real estate, and professional services sector with a coefficient of 7.42 percentage points in OLS, and 3.93 percentage points after controlling for and removing firm specific effects.

Assuming that the indicated unobserved profitability difference is due to profit shifting, and based on their results from the OLS and fixed effects estimations, the authors estimate that the taxable income for corporations operating in Norway is between 15 and 26 billion NOK (measured at 2008 prices) lower than it should have been. This number is comparable to the 29 billion NOK that the Norwegian Tax Administration reports as withheld from taxation, of which half is assumed to relate to profit shifting by internal transfer pricing.[1]

In addition to the major studies mentioned above, several master theses have been written about profit shifting and tax avoidance in Norway, some of which are publicly available. "*Profit Shifting in Norway*" from 2007 and the later report *"Taxable Income Differences Between Multinational and Domestic Corporations in Norway: A Panel Data Approach"* from 2010 by Julia Tropina is the first report using a panel data approach on Norwegian firms to determine differences in the taxable income to turnover ratio.

[1] See section 1 for details.

2.6 The dual income tax system

There is however one problem that has yet to be addressed in studies of profit shifting in Norwegian firms. All of the studies mentioned so far have been using a dataset that ends before 2006, meaning that corporations in the sample were taxed under the dual income tax system of 1992-2005. Before the tax reform act of 2006, the marginal tax rate on personal income or wages could be as high as 59% (Alstadsæter & Wangen, 2010). Comparatively, the marginal tax rate on dividends could be as low as 28%. In 2006, the marginal tax rate on personal income was lowered to a maximum of 47.8%, while the marginal tax rate of dividends was increased to 48.16% in order to address this unbalance in taxation.

Prior to 2006, owners who were employed in their own corporations could possibly opt to receive no wages, but rather receive dividends. Clearly, if the owners themselves could chose to either receive dividends or wages it is hard to imagine they would opt for the higher taxed personal income, when dividends were taxed at a lower rate. The owners could receive dividends taxed at only 28% if the corporation was taxed at the widely held regime. Corporations were taxed at the widely held regime if the *active owner* owned less than two-thirds of the corporation. If the active owner held more than this amount, the corporation were taxed at the closely held regime and dividends would be taxed at a higher rate. These different regimes gave owners who sold or traded away one third of their corporation the possibility to receive payment for their labour as low taxed dividends, rather than high taxed wages. Considering the payroll tax of 14.1% that corporations have to pay in addition to wages, it was even more lucrative to receive labour compensation as dividends for owners employed in their own corporation.

Alstadsæter and Wangen (2010) analyse how corporations respond to tax incentives under the mentioned tax regime. Their analysis suggests that the corporations under the widely held regime had up to a 41% higher profit than comparable corporations taxed under the closely held regime. Alstadsæter and Wangen (2010) find that the probability of being taxed under the widely held regime increase with the size of assets, and falls with labour costs. This indicates that owners of small corporations, who had the most to gain, adapted their ownership structure in order to be taxed under the widely held regime.

Prior studies of income shifting in Norway have found a difference in profitability, or the taxable income to turnover ratio between international and domestic Norwegian

corporations. In these studies, domestic Norwegian corporations were found to be more profitable. Assuming that the typical corporation where the owner also is employed in the corporation is a small or medium sized domestic Norwegian firm, some of the difference found in profitability may be due to the fact that some corporations were taxed under the widely held regime, where the owner chose to receive dividends rather than wages. By reducing the wage cost, and receive labour compensation as dividends, profitability increase. Parts of this effect may have been captured by the size dummies in previous studies, as size did correlate with corporations under the widely held regime (Alstadsæter and Wangen, 2010).

Tropina (2010) is the only one who has attempted to control for the possibility that multinational corporations pay higher wages than national corporations. She introduces wages as a share of total costs as a proxy variable for the wage level of firms, in order to capture the effect of this possibility. This proxy variable has one flaw however. Assuming that multinational corporations do profit shift their income abroad by setting high internal transfer prices, their costs will naturally be higher than comparable Norwegian corporations. Tropina's wages to cost ratio may thus be biased by *both* artificially high costs and wages in multinational corporations. In short, the assumed higher wages could be partly neutralized by the assumed higher costs. Tropina (2010) finds that foreign controlled corporations has a lower wage cost share of total cost than domestic corporations. This suggests that the variable may be influenced by other factors as explained above.

The wage as dividends problem will partly have solved itself, as the marginal tax rate gap between dividends and labour has been reduced in the post 2006 tax regime. However, the tax system still enables dividends that partly can be withdrawn to a tax rate of 28%. If the amount withdrawn is less than or equal to the *risk free return* on invested capital ("Skjermingsfradraget", Skatteloven §12-12), the marginal tax rate will be 28%. For every NOK above this amount, the marginal tax rate will be 48.16%. This is the reason why owners withdrew large dividends from their corporations in 2005 in Norway. By injecting the withdrawn dividends as equity, owners increased invested capital and thus the amount that can be withdrawn at a tax rate of 28% in the future.

However, even after the given risk free return is reached, it may still be profitable for the owners to receive wage as dividends. Including the payroll taxes, marginal tax rate on labour could reach 54.25%. As the example in figure 1 indicate, after "Skjermingsfradraget" up to

200 000 NOK it will be most profitable to receive compensation as labour wages up to 490 000 NOK. After this amount however, it will be more profitable to receive compensation as dividends. Though receiving wage as dividends is not as lucrative as during the previous tax regime, this may still affect estimated coefficients on the difference in profitability between international and domestic corporations.

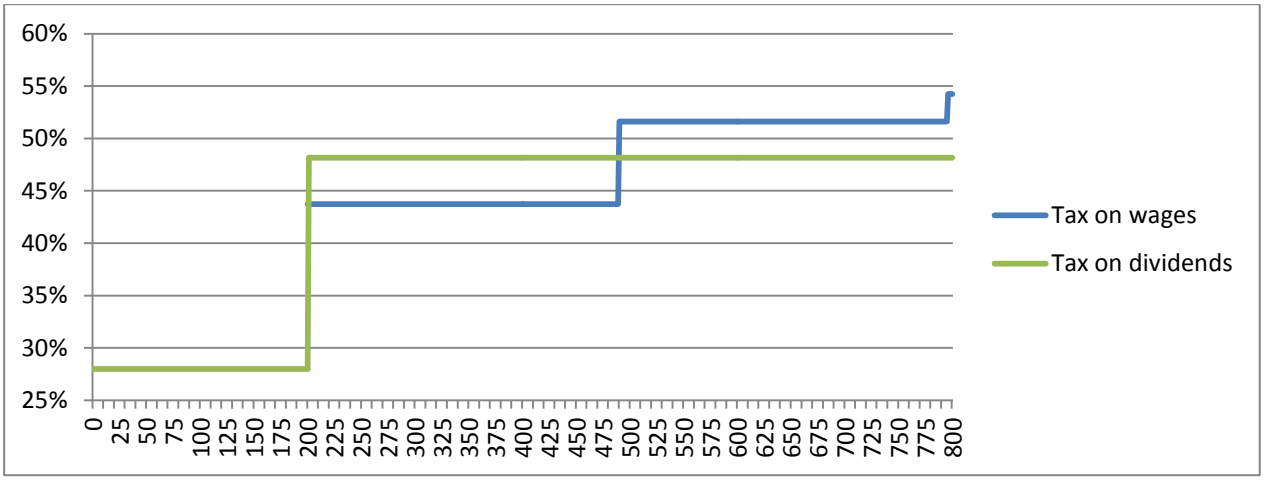

Figure 1: Marginal tax rates by income

It will be interesting to find out if the differences found by Langli and Saudagaran in 2004 and Balsvik *et al.* in 2010 still holds with newer data from after the tax reforms act of 2006, or if Norwegian owners are making their corporations artificially profitable in order to increase their post-tax income by opting to receive dividends rather than wages as labour compensation.

3. Problem formulation

3.1 Hypotheses

This thesis will utilize data post the 2006 tax regime in Norway. The purpose of the thesis is to find out if international corporations have a lower profitability than comparable domestic Norwegian corporations, which could indicate profit shifting. Also, I want to compare results from the new tax regime with the results of the studies conducted with data from the old dual income tax system, while controlling for the fact that it may be possible for some owners to receive wage as dividends. My null hypotheses are thus as follows[2]:

[H1] H_0: Corporations where the owner is employed are equally profitable as corporations where the owner is not employed.

[H2] H_0: Foreign Controlled Corporations (FCCs) are equally profitable as Domestic Norwegian Corporations (DNCs).

[H3] H_0: Norwegian Multinational Corporations (NMCs) are equally profitable as Domestic Norwegian Corporations (DNCs).

I will test [H1] by including the variable which indicates if the owner is employed in the same corporation in the test for hypotheses [H2] and [H3]. This will allow me to estimate to which extent the previous Norwegian studies may have been biased in the event that [H1] is rejected.

Hypotheses [H2] and [H3] are two-sided. There reason for the two-sided test is that there is a possibility that for some corporations, Norway will be a low tax country. For these corporations there are incentives to shift profit to Norway for taxation, which can lead to a taxable income that is higher in multinational than in Norwegian corporations. The direction of the bias depends on to which extent revenue is shifted to or away from Norway. It is necessary to test both hypotheses in order to find comparable results with the previous studies in Norway. Further, it's not certain that the only incentive for profit shifting is to reduce taxes. Other factors might be of importance, which also calls for a two sided test.

[2] See section 4.3 for the definition of the nationality groups (DNC/FCC/NMC).

3.2 Choice of method

In this thesis I will utilize both descriptive statistics and the indirect method in order to answer the hypotheses in 3.1. The indirect method is also the method used in the previous studies of profit shifting in Norway, which will give me the opportunity to compare my results with the results of previous Norwegian studies. While the direct method is the preferred method and probably would give a better understanding of the extent to which corporations operating in Norway profit shift, the necessary data is hard to come by. The necessary data for the indirect method is in its entirety publicly available for researchers.

Like in previous studies utilizing the indirect method, I will estimate the unobserved profitability differential between the different groups of firms using both OLS and fixed effects.

3.3 Control for ownership

I will control for the fact that in some circumstances, it will still be preferable for owners who is employed in the same corporation to receive labour compensation as dividends instead of wages. Unlike previous studies however, I do this by introducing a variable which indicates if the chairman of the board is the same person as the CEO. This variable is a proxy variable which indicates where it is possible that the owner is employed, and has the option of receiving dividends as compensation. As such, it may not capture the entire effect of dividends as compensation, but it is in my opinion a good approximation.

4. Data

4.1 Sources

The data utilized in this thesis is gathered and prepared by the Norwegian Tax Administration (Skatteetaten). It contains data from several governmental sources, which are listed below. The dataset is of high quality with few common data-related problems such as missing values. The base dataset has 1.2 million observations and include more than 227 000 corporations operating in Norway in the period 2006-2011.

Entity Registry (Enhetsregisteret).

The Norwegian Entity Registry was established in 1995 and aims to gather basic information about corporations collected by different governmental sources. It is not publicly available, but researchers can apply for and receive anonymized data. It contains information about employees, roles, and ownership making it possible to identify corporations where the Chairman of the Board or other board members also are employed as CEO. Additionally, the ownership data makes it possible to identify and separate foreign controlled and domestic controlled corporations.

The registry also contains basic information such as the date the corporation was established, the NACE (sector) code of corporations, and which organizational form the corporation has.

One problem with using this registry is that the NACE standard was changed in 2009, meaning that a corporation which has not changed industry may have changed NACE code. This is a problem, as manually recoding all of the NACE codes would take too long. I have solved this problem by replacing older NACE codes with the observed 2009 code. The 2009 code will not exist for corporations that have gone bankrupt prior to 2009 so this operation will result in some missing values. Fortunately, these are few. Only around 12 000 observations are missing their NACE code in the final sample after restrictions.

*Registry of Financial Statements (*Regnskapsregisteret, Brønnøysund).

Financial statements of all corporations are registered in “regnskapsregisteret” in Brønnøysund. The registry saves all financial information as reported by corporations

operating in Norway, in accordance with the standard "Norsk Kontoplan". The financial information utilized in this thesis originates from this registry.

As often is the case for large datasets containing financial information, there are some challenges. Most notably, the assets and equity & debt sides of the balance sheet do not always match up for the corporations. Setting z = Assets – Equity – Debt returns a value for z different from 0 for 434 515 of the total 1.2 million observations in the base sample, around 36% of the observations. The mean of the z values which are different from zero is 120 220 NOK positive, indicating that the asset side is overvalued.

As it is the asset side that is slightly overvalued, my first thought was that this could have been a result of minority interests being excluded from the reported equity. However, this is not in accordance with *Regnskapsloven* §6-5 which states that minority interest should be included in the sum of equity. By taking a closer look at the deviation I found that 9 419 observations of z have an absolute value larger than 50 000 NOK, while 14 527 observations of z deviates from zero by more than 1 000 NOK. The small size of the deviation indicates that it is unlikely to originate from missing minority interests. It seems more likely that the difference in z is caused by a typing or archiving error. As I do not want these errors to influence my estimates, I've chosen to drop observations with an absolute z value greater than 1000 NOK.

Controlled transactions and accounts outstanding (RF-1123).

Every corporation that has transactions with related parties documents these transactions in RF-1123 and sends it to the Norwegian Tax Administration annually. The purpose is to control transactions that may or may not be used to profit shift. In this thesis, RF-1123 is used to identify corporations with foreign subsidiaries. Data for RF-1123 exists only for the years 2008 and after. This means that Norwegian corporations with foreign subsidiaries could possibly be classified as a domestic corporation prior to 2008. To correct for this, I've assumed that corporations with foreign affiliates in 2008 also had foreign affiliates in 2006 and 2007. This assumption is supported by the fact that in 2008, the number of domestic corporations fell, indicating that some of them transitioned to the group with foreign affiliates. While unfortunate, the operation is absolutely necessary. If left unattended, the sudden change in status in 2008 for *all* of the multinational corporations will seriously influence my fixed effects estimations.

4.2 Dependent variable

Both Langli & Saudagaran (2004) and Balsvik *et al.* (2010) use a specification first presented by Klassen *et al.* in 1993. Their dependent variable and profitability measurement is *taxable income in relation to sales*, where *taxable income (TI)* is classified as:

$$TI_{i,t} = NIBT_{i,t} + \frac{(DTL_{i,t-1} - DTL_{i,t} + DTA_{i,t} - DTA_{i,t-1})}{TR_{i,t}} \qquad (1)$$

where

i = Firm indicator;

t = Year indicator;

$NIBT_{it}$ = Net income before taxes for firm i in year t;

$DTL_{i,t}$ = Deferred tax liability for firm i in year t;

$DTA_{i,t}$ = Deferred tax assets for firm i in year t;

$TR_{i,t}$ = Effective tax rate for firm i in year t, computed as ($TE_{i,t}$ / $NIBT_{i,t}$) if $TR_{i,t}$ is in the range 0.1-0.6. $TR_{i,t}$ will be either be rounded up to 0.1 or down to 0.6 if otherwise.

$TE_{i,t}$ = income tax expense for firm i in year t.

In words, *taxable income* expresses a corporation's result or net income before taxes, adjusted for deferred taxes. *Taxable income in relation to sales* may sometimes be referred to as *profitability* in this thesis, while a corporation's total sales may be referred to as *revenue* or *turnover*.

Corporations which have the means and will to profit shift will minimize their taxable income in high tax countries, while maximizing taxable income in low tax countries. Assuming that most corporations treat Norway as a high tax country, the expected result is a lower taxable income for corporations with the possibility to profit shift compared to corporations with similar revenue without the possibility to shift profits. As such, the *taxable income in relation to turnover* variable seems like a good dependent variable for the purpose of this thesis. Using ratios in empirical estimations can be problematic and result in spurious results (Kronmal, 1993), but as I want to find out if there are differences in profitability I have to use a profitability ratio, such as taxable income in relation to total sales.

Deferred tax assets or liabilities are divided by the tax rate as a corporations' income tax expense does not directly translate to *actual* taxes paid due to timing differences for some costs and income items. A firm constructing an object over a long period of time may recognize parts of the agreed selling price in their financial statement prior to completion, even though the full amount may not be due before after completion (IAS 11). Tax authorities will not tax this type of income, as the cash inflows are yet to occur and all risk is still held by the seller.

While tax on items that cause deferred tax expense may not yet have been paid, it will have been recognized simultaneously as revenue as a deferred tax liability, and thus increasing the income tax expense for the corporation. By adjusting the net income before taxes with deferred taxes divided with the tax rate, the specification will have controlled for non-taxable income. The non-taxable part of the income will be removed and realized upon completion of the contract, rather than when recognized in financial statements.

Small Norwegian corporations may choose whether or not recognize deferred tax assets. (NRS 8 *God regnskapsskikk for små foretak*). Different accounting practices could underestimate taxable income for the corporations that do not recognize deferred tax assets. I do not know to which extent Norwegian firms utilizes this possibility, and this may affect the results of the thesis. From a rational point of view however, recognition is preferable as it will result in a higher equity than not recognizing the deferred tax asset.

Klassen *et al.*'s (1993) specification uses the effective and not the statuary tax rate, which enables the authors to control for permanent differences between tax- and financial deductible costs. Permanent differences lead to a higher effective tax rate as these differences are costs which are deductible in financial statements, but not deductible for tax purposes. Though minor, the majority of permanent differences are firm specific. Using the effective tax rate in the model thus seems to be the rational choice, as using the statutory tax rate may lead to spurious results.

As all the necessary data are available in firms' financial statements or other publicly available sources, the specification is frequently used. Both the major studies of Norwegian firms have utilized this specification. It is also clear and easy to understand. As I see no major weaknesses with the specification other than the recognition problem for small Norwegian firms and the ratio issue, I have chosen to utilize this specification in this thesis.

4.3 Explanatory Variables

Nationality:

Corporations are divided into groups based on their nationality. The groups are defined as follows:

- Domestic Norwegian Corporation (DNC) – this group contains the corporations that are not owned by foreign entities, have no foreign subsidiaries, and operate only in Norway.
- Foreign Controlled Corporation (FCC) - this group contains corporations that are majority owned (>50%) by foreign entities, or has reported to authorities that they are a foreign entity, or has the organizational form "*Norwegian Foreign Registered Corporation (NUF)"*.
- Norwegian Multinational Corporation (NMC) – this group contains corporations that are majority owned by Norwegian entities but has inter-corporate transactions with foreign affiliates.

The benchmark groups in this thesis will be the DNCs. The resulting coefficient of each nationality group will indicate the unobserved profitability difference between domestic Norwegian and both FCCs and NMCs, which will give the answer to my hypotheses presented in section 3.

Other explanatory variables:

Industry/sector and year indicators.

A sector indicator is included as different sectors experience different profitability. This is due to a number of reasons. An example is that while some sectors have weak entry barriers, others have stronger and enjoy a higher profitability as a result of the less intensive competition. The sector is determined on the basis of the corporations' 3 digit NACE-code, which makes it possible to distinguish between the numerous sub-sectors within each industry. This variable is similarly included in both Tropina (2010) and Balsvik *et al.* (2009), but not in Langli & Saudagaran (2004). Langli & Saudagaran (2004) only distinguish between traditional industry and the retail sectors.

I've also included a year dummy that is meant to capture shocks in the economy that affects every firm. Such shocks may be changes to exchange rates, interest rates, and in salary/compensation negotiated by unions on a national level.

Leverage ratio (IBD/TC).

It's necessary to include a leverage ratio in the analysis. Corporations with higher leverage will usually have higher financial expenses, reducing their taxable income. Corporations also have the possibility to profit shift by debt financing their subsidiaries. The leverage ratio controls for this possibility, though not perfectly as it is impossible to distinguish between intra-company and external debt with my dataset. It's not possible to distinguish between interest bearing or non-interest bearing debt either, and the actual interest rate is unobserved, which further complicates the choice of leverage ratio. As corporations' long term debt usually is non-operating and interest bearing, I've chosen to use long term debt to total capital as a leverage ratio. The expected sign for the coefficient of leverage ratio is negative, as interest payments reduce taxable income.

Tangibility.

As both Tropina (2010) and Balsvik *et al.* (2009) I've included an asset ratio in the estimation. Unlike their fixed assets to total assets ratio however, I use a ratio of tangible assets to total assets. I find it hard to argue that fixed assets should positively impact the taxable income of a corporation compared to a corporation which rents its equipment.

While it is often expected that corporations which invest in research and development are more profitable in the long run, it's difficult to predict the sign the coefficient of this ratio. The balance sheet does not indicate the true level of R&D in every firm. According to Regnskapsloven (§5-3) intangibles should be recognized in the balance sheet as an asset. However, corporations may choose to expense costs in R&D as they are incurred (Rskl. § 5-6, IAS 38). Until steady state where depreciation of intangibles equal investment in intangibles, corporations that recognize its intangibles in the balance sheet should have a higher taxable income than corporations expensing R&D immediately. Valuation of intangible assets is difficult. Often intangibles have no other application than in which it is employed and in the corporation owning it, making it worthless to anyone else and as security for debt. Corporations with a greater ratio of tangible assets may thus enjoy cheaper financing, increasing taxable income.

Size.

The different sizes of corporations will be captured by grouping the corporations by their total revenue. As in both Langli & Saudagaran (2004) and Balsvik *et al.* (2009) I will use dummies for each of the 5 quintiles of operating income. I use the first quintile containing the smallest corporations as the reference group. The dummy "Sales 2" will be of value 1 if the firm observed belong in the second sales quintile, and zero otherwise. The expected sign of the sales quintiles is positive, as larger corporations may enjoy greater economies of scale which will increase taxable income. However, as Tropina (2010) states, larger corporations may have increased incentives to shift profits. Tax planning and profit shifting can also be complex and expensive, as it requires specialized knowledge. Major firms have global tax strategies and executives with the sole purpose of minimizing taxes. (Russo *et al.* 2007, pp 71-85). This may affect the sign of the coefficient negatively, especially in the later quintiles containing the largest corporations.

Age.

This variable is included as it is likely that brand new corporations suffer from low initial profitability. Corporations are grouped in five groups after age, each group covering 5 years with the final group for corporations older than 20 years. I use the first group covering corporations younger than 5 years as the reference group. The expected sign of *age* is positive as corporations with weak business plans usually fail early, while profitable corporations remain in business.

Financial income.

Norwegian corporations pay 28% tax on 3% of financial income in the new post 2006 tax regime. Losses on financial instruments are not tax deductible. Foreign corporations are exempted from this rule, and pay nothing. In practice, this means that 3% of the income is realized in financial statements of Norwegian owned corporations and taxed accordingly. Unless I control for this income, omitted variable bias may attribute the increased income in Norwegian corporations to the nationality dummies. Though intuitive, I may get spurious results if I utilize the same denominator, *income* as in the dependent variable (Kronmal, 1993). In this thesis, I use equity as the denominator for the financial income ratio. The expected sign of this variable is likely to be positive, as it increases taxable income if present.

Ownership.

The ownership variable is a proxy variable intended to capture the effect that it may be in some circumstances preferential to receive compensation as dividends rather than wages. This could as previously described happen in corporations where the owner is employed in the same corporation. As such, the proxy is a dummy variable indicating if a corporations CEO and chairman of the board is the same person. This variable is only a proxy and is unlikely to capture the whole effect of employees who receives wages as dividends, though it indicates where this is possible. The expected sign of this variable is positive, as compensation in the form of dividends increases profitability in the corporation. It could also possibly be negative, as professional leadership may influence profitability positively.

4.4 Sample Restrictions

In this thesis I've chosen to restrict the sample in order to get as a homogenous sample as possible. I normalize the sample by excluding extreme and impossible values, which otherwise may impact my estimations. The first seven are based on the restrictions presented by Balsvik et al (2009) which again is based on restrictions presented by Langli & Saudagaran (2004).

- The sample only includes limited liability corporations.
- The sample excludes corporations with assets less than one million NOK.
- The sample excludes corporations with negative sales income.
- The sample excludes corporations which has a taxable income adjusted for deferred taxes to sales ratio greater than 1.
- The sample excludes corporations that have a taxable income adjusted for deferred taxes to sales ratio which deviates by more than 50 % from the reported taxable income to sales ratio.
- The sample excludes corporations that have an interest bearing debt to total capital ratio of less than 0 or greater than 3.
- The sample excludes the petroleum and extraction sector.[3]

[3] Balsvik *et al.* (2009) excludes the petroleum and extraction sector as it is subject to a special tax regime, and consists of extremely large corporations. Langli & Saudagaran (2004) includes only the Retail and Industry sectors.

Additionally, I've chosen to introduce the following restrictions which exclude impossible values:

- The sample excludes corporations with negative sizes for intangible assets and corporations with intangible assets greater than the sum of total assets.
- The sample excludes corporations which have assets that deviate with more than 1000 NOK from the sum of equity and debt, or vica versa. It should be impossible to deviate from zero, but I allow some slack for registration and typing errors.
- The sample excludes corporation with negative taxable financial income. This size cannot be negative, as it measures income.

Finally, to avoid measurement error I exclude all observations of corporations which changes nationality or ownership status twice (See table 7, section 6 for details). The table below indicates the original amount of observations, and how many observations remain after each restriction.

Table 1 – Sample Restrictions.	Number of observations				
Restriction	Total	DNC	FCC	NMC	Percentage
Initial Sample	**1 205 337**	**1 106 041**	**66 999**	**32 297**	**100 %**
Assets >= 1MNOK	836 166	768 323	36 128	31 715	69 %
Income > 0	692 257	635 513	30 459	26 285	57 %
|Adj. Taxable Income / Sales| <= 1	502 966	461 237	23 286	18 443	42 %
|(Adj. Tax. Inc. – Tax. Inc. / Income)| < 0.5	492 357	451 848	22 845	17 664	41 %
0 < Int. Bearing Debt./Tot. Capital < 3	491 583	451 202	22 730	17 651	41 %
0 < Intangibles < Assets	491 449	451 101	22 706	17 642	41 %
|Assets - Debt - Equity| < 1000	484 409	445 189	22 075	17 145	40 %
Financial income >= 0	484 372	445 155	22 073	17 144	40 %
No multiple status changes	473 460	436 565	21 054	15 841	39 %
All sectors	**473 460**	**436 565**	**21 054**	**15 841**	**39 %**
Removing Oil & Extraction	471 396	435 078	20 706	15 612	39 %
Main Sample	**471 396**	**435 078**	**20 706**	**15 612**	**39 %**

Each row contains the amount of observations left after each restriction.

The final sample contains nearly 470 000 observations and more than 138 000 firms. Each corporation has an average of 3.4 observations. Using 3 digit NACE codes there are firms in 255 different sectors in the sample. Of the initial 1.2 million observations, 61% fail to meet all the restriction criterias.

5. Descriptive Statistics

In this section I will present the sample descriptive statistics. The following table describes the amount of observations over time.

	2006	2007	2008	2009	2010	2011	**Total**
Observations	12 792	86 480	88 858	91 492	94 481	97 293	471 396

Table 2: Observations over time.

As table 2 suggests, I have very few observations for the year 2006. While they are kept in sample statistics and in the estimations, I have left them out graphically in the figures throughout this chapter. I deem this necessary as the few observations in 2006 is of mostly larger corporations. Keeping them would lead to inconsistency of the axes in the figures.

5.1 Main Sample Statistics

Table 3: Main Sample Statistics.[4]

Main Sample Statistics			Percentiles			Sample mean by groups		
Variable	Mean	St.Dev	5 %	Med	95 %	DNC	FCC	NMC
Taxable Income	2 061 852	52 800 000	-1 005 070	226 130	5 545 285	882 118	10 700 000	23 500 000
Total Assets	31 100 000	381 000 000	1 180 736	4 499 556	72 700 000	13 200 000	138 000 000	391 000 000
Revenue	31 200 000	356 000 000	309 769	4 969 083	78 700 000	14 400 000	175 000 000	309 000 000
TI / Revenue (y)	9.3226 %	26.5669 %	-28.8481 %	4.7449 %	62.1662 %	9.4806 %	6.8648 %	8.1795 %
TI / Assets	8.6920 %	24.5095 %	-18.0576 %	4.9591 %	45.7176 %	8.8147 %	8.2691 %	5.8323 %
TI / Equity	64.9747 %	91.0130 %	-79.3354 %	23.8013 %	266.1033 %	52.9319 %	352.9638 %	21.4660 %
Tang. Assets/TC	97.7768 %	7.5316 %	88.6763 %	100.0000 %	100.0000 %	97.8937 %	96.2927 %	96.4887 %
IBD/TC	30.9162 %	87.0708 %	0.0000 %	14.5488 %	94.7074 %	31.2880 %	18.4629 %	37.0731 %
Age	14.8501	12.9280	3.0000	11.0000	36.0000	14.6977	16.1676	17.3616
Observations	471 396					435 078	20 706	15 612

As seen from Table 3, the majority of observations in the sample are of Domestic Norwegian corporations (DNCs). I have relatively few observations of Foreign Controlled (FCC) and Norwegian Multinational Corporations (NMC) compared to the observations of the domestic corporations. Obviously this influences the descriptive statistics. The mean taxable income

[4] In the table below, the NMC column corresponds to the DMNC column in Balsvik *et al*. (2009). I have carried over the notation for the two other groups, though I have excluded the DCC group from descriptive statistics. The statistics are not directly comparable, as I use the 2012 value of NOK, while Balsvik *et al*. (2009) deflates to the 1998 value of NOK.

for FCCs and NMCs are 10.7 and 23.5 million NOK respectively, yet the sample mean is 2.06 million NOK due to the low mean taxable income for DNCs. This is especially underlined as the mean taxable income for both FCCs and NMCs is much higher than the income at the 95% percentile.

The story is the same for both assets and revenue. Foreign controlled and multinational corporations are significantly larger than the domestic Norwegian corporations. This influences the sample means, as both are substantially higher than the median of the sample. Foreign controlled corporations do on average hold assets worth ten times the average of the domestic national corporations group, while the multinational corporations are even bigger. In terms of revenue, the difference between foreign controlled and domestic corporations is similar to the difference in assets. The difference between foreign and multinational corporations is still large in revenue, but not as large as in assets.

The taxable income in relation to revenue (TI / Revenue) ratio is the dependent variable and profitability measurement in this thesis. Again, I observe the mean of the sample being around twice the size of the median, which indicates that the sample is influenced by some corporations with very high profitability. Profitability does not seem to follow the trend of the previous sizes. It is the domestic Norwegian corporations that are the most profitable with an average profitability of 9.48%. Norwegian multinational corporations follow with an average profitability ratio of 8.17%, while the corresponding ratio for the foreign controlled corporations is 6.86%. Already in the descriptive statistics I thus find relatively large differences in average profitability between the nationality groups.

An alternative profitability measurement (dependent variable) could be to use assets as denominator instead of revenue. The mean and median of the taxable income to assets ratio closely resembles the ones from the taxable income to turnover ratio. It differs from the TI / Revenue ratio in that the ratio is quite similar for foreign and domestic Norwegian corporations, and lower for the Norwegian multinational corporations. This could be caused by the fact that Norwegian multinationals have incorporated foreign affiliates in their balance sheets, thereby increasing their assets. Thus, it appears unlikely that taxable income in relation to assets will perform well as a dependent variable.

Another possible alternative denominator in the dependent variable is equity. The taxable income to equity ratio does however suffer in the same way as the assets and revenue sizes

do. The mean of this ratio is much higher than the median of the sample. By looking at the ratios by groups I find that this abnormality is caused by the very high taxable income to equity ratio in foreign controlled corporations. At first glance, I thought the large size would have to be caused by mistake. By looking closer, I found around 4 300 observations of foreign controlled corporations with a taxable income to equity ratio above 1. As this is more than 20% of the sample of foreign controlled corporations, I can't easily attribute the high ratio to a measurement error. The high ratio may be caused by rented equipment. Assuming that foreign controlled corporations to a larger degree than their Norwegian counterparts rent equipment and office spaces, less equity is necessary. Due to excessively high taxable income to equity ratio in foreign firms, it appears unlikely that this ratio will function well as an alternative dependent variable.

The corporations in the sample have a very high level of tangible assets, indicated by the tangibility ratio of tangible assets to total assets. The average tangibility ratio is above 96% for every group, and the ratio is close to 98% for Norwegian corporations. This is further underlined by the fact that already at the sample median the tangibility ratio is 100%. At the 5% percentile it remains high at 88.7%. Descriptive statistics do thus suggest that not many corporations have substantial intangible assets, even if most intangibles should be activated in the corporations' balance sheet. Accounting practices do however allow some discretion, and some intangibles can be expensed immediately rather than activated. Rational managers will expense as early as possible, as it saves taxes.

Similar to the findings of Tropina (2010), it appears as if Norwegian corporation have a higher debt ratio than foreign controlled corporations. This is somewhat surprising, as one of the main methods of profit shifting is thin capitalization. Descriptive statistics suggest that thin capitalization isn't common in foreign corporations in Norway. Keep in mind however, that actual interest cost is unobserved.

The average age of corporations in the sample is between 14 and 15 years, while the median is 11 years. This is somewhat as expected, as success or failure often is determined early in corporations' existence. The Norwegian multinationals have the highest average age followed by foreign controlled corporations, while domestic Norwegian corporations have the lowest average age. As it is the international corporations that are oldest, it appears likely that corporations generally seek to acquire necessary financial and operational muscles in domestic markets before turning their attention internationally.

5.2 Taxable income to revenue ratio by groups of corporations over time

As the dataset covers the timespan of the financial crisis of 2008, I thought it would be interesting to examine the dependent variable, *taxable income to revenue* ratio over time. Development of this variable is displayed by the nationality groups in Figure 2 and 3 below.

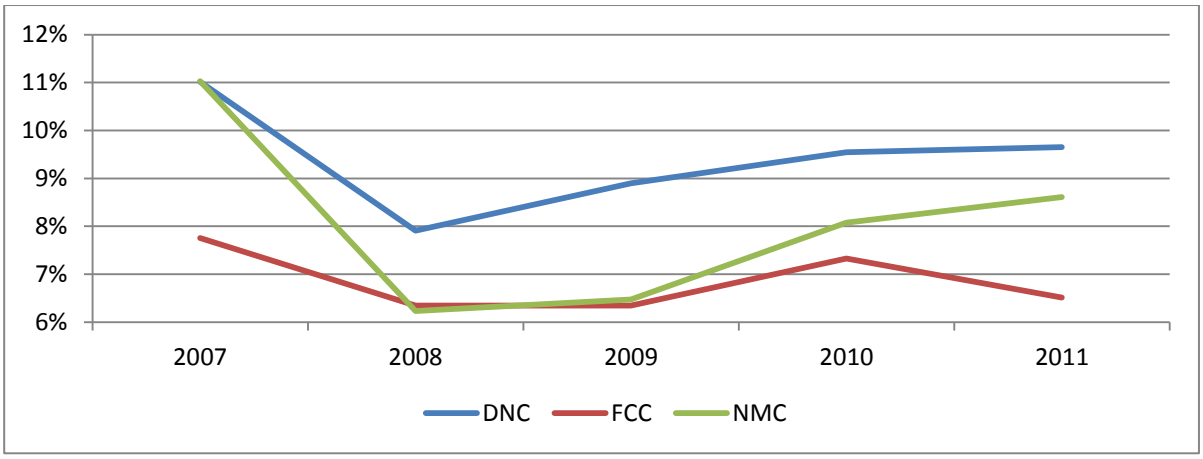

Figure 2: Mean Taxable Income / Revenue ratio (Dependent variable) by groups of firms.

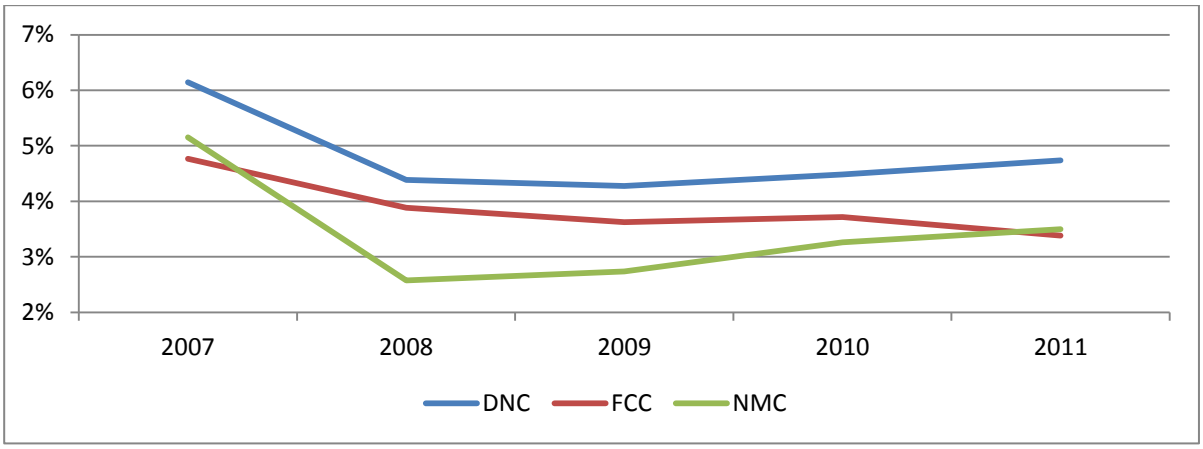

Figure 3: Median Taxable Income / Revenue ratio (Dependent variable) by groups of firms.

By looking at Figure 2 and 3, I observe that profitability for all three groups decreased from 2007 to 2008. The financial crisis of 2008 may be a likely explanation to this. For the internationally exposed corporations profitability changed little between 2008 and 2009, though average profitability did increase in Norwegian corporations from 2008 to 2009. Assuming that the drop in profitability is due to the financial crisis of 2008, this can be explained by the fact that Norway was to a lesser extent than the rest of the world affected by the crisis. Foreign affiliates of Norwegian corporations may have had a harder time than their parent corporations in a tough economic situation in the rest of the world.

One interesting observation from Figure 2 is that it does not seem like the financial crisis was a shock that affected each nationality group equally. The profitability ratio for the foreign controlled corporations group seems relative flat and stable compared to the development in the ratio for Norwegian corporations. This indicates that foreign corporations possibly are more solid with a stronger brand with loyal customer than Norwegian corporations. It could also be explained by the fact that foreign controlled corporations have more flexible costs, and are able to adjust their cost level to changing economic trends. Finally, if foreign controlled corporations profit shift by internal transfer pricing, they may have shifted less profits and thereby reduced their costs. The decrease in profitability from 2010 to 2011 further underlines this, as this development is not reflected in either of the other two nationality groups.

5.3 Ownership Variable Statistics

One of the main features of this paper is the introduction of a proxy variable that indicates if the CEO of a corporation also is the chairman of the board (CoB). The goal of this proxy variable is to indicate where it is possible for owners to receive wages as dividends. In table 4 below, I illustrate how common this is in corporations in the sample.

Number of observations	**DNC**	**FCC**	**NMC**	**Sample**
CoB is employed	47.38 %	17.52 %	10.54 %	44.85 %
Mean Taxable Income/Revenue (by CoB)	**DNC**	**FCC**	**NMC**	**Sample Mean**
CoB is employed	10.72 %	8.97 %	8.39 %	10.68 %
CoB is not emplyed	8.36 %	6.42 %	8.15 %	8.22 %
Difference	2.36 %	2.56 %	0.24 %	2.46 %
Mean Taxable Income (by CoB)	**DNC**	**FCC**	**NMC**	**Sample Mean**
CoB is employed	603 042	4 484 509	6 693 519	717 051
CoB is not emplyed	1 133 402	12 000 000	25 500 000	3 155 407

Table 4: Ownership Variable Statistics.

From table 4 I observe that in nearly 45% of the observations, the chairman of the board is the same person as the CEO. This is much more common in Domestic Norwegian Corporations (DNC), than in Foreign Controlled Corporations (FCC) or Norwegian Multinational Corporations (NMC). It is still surprisingly common in the corporations in the FCC group, where in 17.52% of the observations the chairman of the board is the same person as the CEO.

In table 4 I also observe the difference in profitability, measured by taxable income in relation to revenue between corporations where the owner is employed and not. This difference is quite substantial in both the DNC and FCC groups of corporation, which may indicate that owners either chose to receive wages as dividends or receive no wages at all. It is hard to imagine a different explanation for the differences found in these groups. The observed difference in the group containing Norwegian multinational corporations is comparatively small, which is a little surprising considering the differences observed in the other groups. The only likely explanation I can offer for this is that chairmen of Norwegian multinational corporations that are employed in the corporation as CEO are more likely to receive compensation comparable to professional CEOs.

As figure 4 below indicates, the gap in profitability between corporations where the CEO also is the Chairman of the board seems stable over the analysis period. The difference seems to lie in the range of between 2 pp. and 3 pp. every year. Do note however that this figure is heavily influenced by the domestic Norwegian corporations. Figures isolating the profitability for all three nationalities of firms conditional on ownership can be found in Attachment 1.

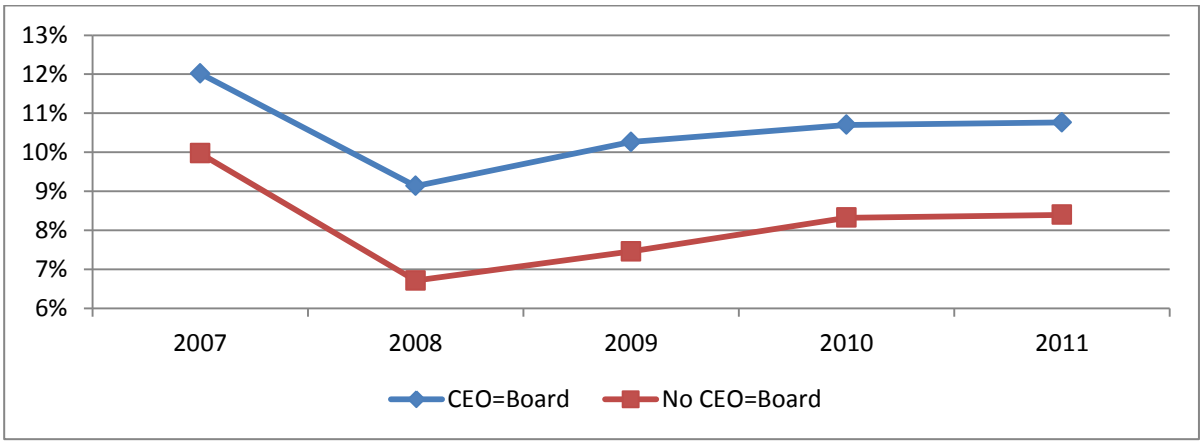

Figure 4: Profitability (Taxable income/Revenue) by ownership over time

Corporations where the CoB is employed are in general smaller than corporations without an employed CoB measured at taxable income. This is as expected, as larger corporations are likely to require professional leadership. Assuming that larger corporations are more likely to shift profits, some of the effect of size may be captured by the ownership variable instead unless size is well controlled for. As I control for size by using five quintiles of sales, I have illustrated the frequencies of the ownership variable by the sales quintiles in table 5.

	Quintiles of size (sales)					
Ownership	Q1	Q2	Q3	Q4	Q5	Sum
Owner is employed	46 414	50 312	46 676	40 741	27 269	211 412
Owner is not employed	47 881	43 952	47 603	53 538	67 010	259 984
In Percent	49.22 %	53.37 %	49.51 %	43.21 %	28.92 %	44.85 %

Table 5: Ownership in quintiles of Size.

The spread does seem quite evenly distributed with the exception for the final quintile which contains the largest corporations. In this quintile, the majority of observations are of firms where the CoB is not employed in the same corporation. This is relatively good news for my regression analysis, though it does seem like a good idea to separate the groups by size and analyse them individually in a robustness test.

5.4 Size

In this thesis I control for size by using five quintiles of sales. This is comparable to previous studies, but still problematic. One problem is the distribution of observations by size. Some corporations have very high sales compared to the majority of corporations in the sample. The frequencies are displayed in the kernel density figure displayed in figure 5 below:

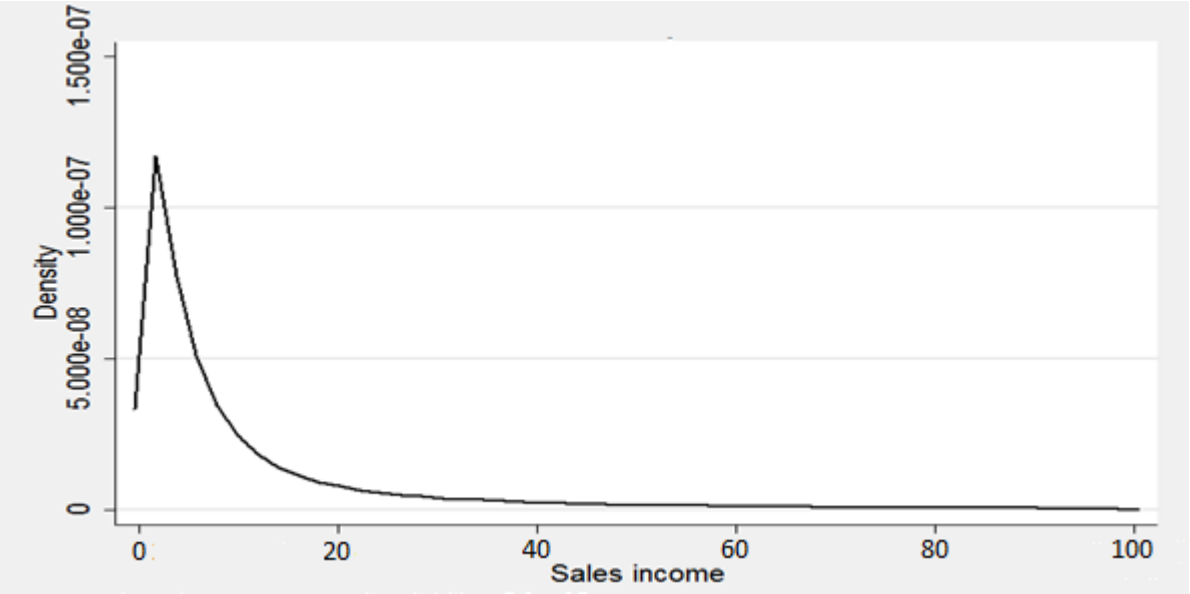

Figure 5: Frequencies by income (in million NOK)

The area below the graph illustrates the probability of getting a sales value as indicated by the x axis. Figure 5 illustrates that there is a majority of observations with sales values between 0 and 20 million NOK. Note that observations with sales income above 100 million NOK is left out of the density chart. 18 192 observations has a sales income higher than 100

million NOK. In terms of quintiles, this is a little problematic as the final sales quintile covers corporations of a quite wide range of sales income. In fact, this quintile covers sales income from 18.1 million to 59.4 billion NOK. The minimum and maximum values for each quintile are described in table 6 below.

Income / Quintiles	Q1	Q2	Q3	Q4	Q5
Min	0	1 280 934	3 469 644	7 146 859	18 100 000
Max	1 280 910	3 469 638	7 146 753	18 100 000	59 400 000 000
Observations	94 295	94 264	94 279	94 279	94 279

Table 6: Minimum and Maximum values for the sales quintiles.

Table 6 suggest that 5 sales quintiles may not be enough. As the income in the fifth quintile spreads from 18.1 million to nearly 60 billion NOK, this quintile covers a wide range of corporations and may not be able to capture effects typical for very large corporations, such as economics of scale. For this reason I have increased the number of sales quintiles to 20 in the robustness section (Section 8.1).

Additionally, there may be endogeneity problems as sales income is used as the denominator in the dependent variable in addition to in the sales quintiles. Due to this, it is appropriate to lag the sales quintiles one year in the estimations. It is questionable to which extent last year's sales impact profitability this year, but last year's sales income is a good measure of the size of a corporation. Unfortunately, introducing lags to the model does mean that one less cross section is considered in the regression analysis.

6. Estimation Specification

The basic specification of the ordinary least square regression used in this thesis is similar to the specification used in previous literature, among them Grubert *et al.* (1993), Klassen *et al.* (1993), Langli and Saudagaran (2004), Balsvik *et al.* (2009) and Tropina (2010). It has also been used in several master theses. The basic OLS specification is as follows

$$\pi_{it} = \beta_0 + \beta_1 D_{it}^{group} + \gamma X_{it}^{control} + \varepsilon_{it} \quad (1)$$

Profitability (π_{it}) is measured as the ratio between taxable income and total sales. Corporations are grouped by nationality and the groups are tested against a reference group in the estimation. The group variable (D_{it}) express which group that is tested. It will either have the value FCC indicating that foreign controlled corporations are tested against the reference group domestic Norwegian corporations, or the value NMC indicating that Norwegian multinational corporations are tested against domestic Norwegian corporations. The coefficient in front of the group variable (β_1) will express the estimated difference between the tested and reference group. This is the so-called *unobserved difference* between the nationality groups that the control variables are unable to capture. If the estimated coefficient has a positive sign, it indicates that the tested group has a higher profitability than the reference group. The expected sign of the group variable depends on the group tested. A regression of profitability on the group variable only without a constant will result in the same observed differences as in the descriptive statistics. However, it is assumed that profitability also varies with observable corporation specific characteristics. Additional variables are introduced in order to find the profitability difference conditional on the included control variables in X_{it}. The descriptive statistics did show that both size and debt ratio do vary between the nationality groups. Assuming that both size and debt ratio does affect profitability, the regression results will suffer from omitted variable bias unless these two factors are controlled for in the specification. In this specification I control for leverage, tangibility, size, age, and financial income.

I also include year and sector dummies as control variables. The year dummies are meant to capture shocks in the economy that affect all the corporations in the sample, but are time dependent. The sector dummies are meant to capture permanent differences in profitability between different sectors. Also, I identify corporations where the owner is also the CEO by using a dummy variable. I suspect that the effect of this variable on profitability may be

slightly time-delayed. Owners have to keep their money invested in the corporation for over a year in order to fully utilize the tax free return on the invested capital ("Skjermingsfradraget"). The amount possible to withdraw as dividends without incurring taxes is a linear function of time. For example, if an owner starts a corporation in December, he can only withdraw (1/12 * Risk free return * Invested capital) for that year. Someone who starts a corporation in January may withdraw the full amount, equal to the risk free return multiplied with invested capital. Including the lagged ownership variable is an appropriate control for this. (Wooldridge, 2009, pp 483-484). ε_{it} is the error term.

One issue with the current specification and estimation method is as I repeatedly observe the same firm in the sample, it is no longer appropriate to assume that different observations are independent (Verbeek, 2012). The standard errors computed in an OLS regression is based on the assumption that the error terms are independently and individually distributed (i.i.d.). However, as I observe the same firm repeatedly in the sample it is likely that the error terms are correlated. For an instance, Maffini and Mokkas (2009) suggest that multinational corporations have a higher level of productivity. A corporations' productivity level is unobserved in the sample. It will vary little over the period of time in the analysis, but it will definitively affect the dependent variable profitability. If the error term does in fact correlate with the dependent variable, the specification suffers from heteroscedasticity. This does not however mean that OLS is inefficient, as I will use a cluster-robust covariance matrix to adjust the standard errors for general forms of heteroscedasticity and autocorrelation (See Verbeek, 2012, pp 389-390).

Another problem arises if the unobserved productivity or any other firm specific effect (α_i) is correlated with the nationality groups or any of the other explanatory variables. If so, the exogeneity assumption of the explanatory variables will be violated. The estimation specification will suffer from omitted variable bias, and the explanatory variables that correlate with the unobserved productivity will have biased coefficients. The exogeneity assumption could be violated for the ownership and nationality variables, which probably is correlated with number of employees and productivity. Number of employees is unobserved in the specification, though number of employees may not influence profitability.

It is difficult to estimate the sign of the bias on the nationality variable. Assuming as shown by Maffini and Mokkas (2009) and Mayer and Ottaviano (2008), that it is the most productive firms that expand internationally, the OLS estimation likely overestimate the

coefficient of the multinational group. Balsvik and Heller (2009) find that acquisitions of Norwegian firms by foreign entities usually are of corporations in growth. This also suggests that the coefficient of the foreign controlled corporation group variable will be overestimated. For the purpose of interpreting the resulting coefficients, it means that the coefficients for the multinational and foreign controlled groups are likely to underestimate the assumed profit shifting for tax purposes by international firms in OLS.

To control for the unobserved firm specific effects I use a *fixed effects estimation*, which also is commonly found in previous literature. This estimation method allows the intercept to not only vary between sectors, time, and ownership status, but also between individual firms. Assuming that firm specific effects α_i are constant over time, they will be removed by demeaning the equation in 1 as shown below.

$$\ddot{n}_{it} = \pi_{it} - \bar{\pi}_{\iota} = \beta_1 \ddot{D}_{it}^{group} + \gamma \ddot{X}_{it}^{control} + \ddot{\varepsilon}_{it} \qquad (2)$$

Where $\ddot{n}_{it} = \pi_{it} - \bar{\pi}_{\iota}$ (2) is the time-demeaned data on y and similarly for the explanatory variables and the error-term (Wooldridge, 2009). As specified in equation 2, the estimation is run on the deviation between the variables and their mean values. This also holds true for any variable that is constant over time. Unfortunately, this means that observations of firms where the variables do not vary within the period of time in the dataset will not be taken into account in the estimation. In the fixed effects estimation, I compare the change in profitability in corporations who are sold to foreign entities or bought back home, to the reference group of corporations which retain the nationality of their ownership during the analysis period. I also compare the change in profitability for corporations where the chairman of the board either becomes CEO, or steps down as CEO. As in the OLS estimation, the lag of the ownership variable is included. I suspect that in most cases the full effect of the fact that the CoB also is the CEO can't be realized before the year after the owner assumes control.

One problem with the fixed effects estimation method is however that measurement error may seriously influence the independent variables, and especially the nationality and ownership dummy variables. Corporations wrongly classified as either multinational or domestic one year and corrected the next, will be treated by fixed effects as a real change in nationality. If this is common, profitability may not change as the incentive and possibility to shift profits are still the same as before. Assuming that there are more cases of

misspecification of foreign ownership than cases where corporations do not report the change, the direction of the bias will be negative in absolute terms (It will lead to a coefficient estimated closer to zero than true). The same is true for the indicator variable which indicates if the chairman is CEO or not. From table 7.1 I notice that 1 393 observations of chairmen becoming CEO changes back again to no role. One explanation can be that when corporations underperform, the chairman of the board assumes control of the corporation and then steps down when an appropriate candidate for CEO is found. However, the large amount of multiple changes suggests that measurement error also may be at cause. For this reason, firms who change nationality or ownership status twice or more are dropped, as described in section 4.4.

Status Changes	Observations
Firm is National -> is Foreign Controlled	2 152
Firm is Foreign Controlled -> is National	793
Firm is National -> is Norwegian Multinational	1 767
Firm is Norwegian Multinational -> is National	1 175
Firm is NMC/FCC -> is DNC -> is NMC/FCC	324
Firm is DNC -> is NMC/FCC -> is DNC	192
CoB is not CEO -> is CEO	7 196
CoB is CEO -> is not CEO	7 127
CoB is not CEO -> is CEO -> is not CEO	555
CoB is CEO -> is not CEO -> is CEO	1 393

Table 7.1: Status changes in Fixed Effects
(Prior to the no multiple status changes restriction)

Dropping the observations is unfortunate, but I trust the estimation results where the multiple status changes are dropped more than the estimation results containing the dropped data. I will however include the dropped observations in a robustness check in section 8. After dropping the multiple status changes, I am left with the following changes in nationality and ownership as described in table 7.2 below.

Status Changes	Observations
Firm is National -> is Foreign Controlled	1 789
Firm is Foreign Controlled -> is National	491
Firm is National -> is Norwegian Multinational	1 468
Firm is Norwegian Multinational -> is National	902
CoB is not CEO -> is CEO	5 288
CoB is CEO -> is not CEO	5 200
Change in both Nationality and CoB=CEO	167

Table 7.2: Status changes in Fixed Effects
(After the no multiple status changes restriction)

7. Empirical Results

7.1 Main Results

Table 8 on the next page shows the estimated coefficients by both Pooled OLS and Fixed Effects estimations using the indirect method as described in section 2.2 and 2.3. Please note that I do control for year and sector by dummies where this is appropriate, but these variables are omitted from the table due to size limitations. In the main regression output, Norwegian Multinational Corporations (NMCs) and Foreign Controlled Corporations (FCCs) are tested against the reference group Domestic Norwegian Corporation (DNC). An F test for heterogeneity suggests that firm specific effects are correlating with my explanatory variables, thus the estimated coefficients in OLS suffers from omitted variable bias. For this reason, fixed effects should be considered as the preferable estimation method.

Surprisingly, I find a positive coefficient for the Norwegian multinational corporations in OLS. As the coefficient becomes insignificant in the fixed effects estimation, I can't claim that these corporations are more or less profitable than domestic Norwegian firms. The insignificance of the fixed effect estimation could also possibly be caused by the fact that for some firms, Norway will be a low tax country. Under such circumstances, these firms would prefer to profit shift to Norway rather than away from it. Also, the positive OLS coefficient may be caused by the fact that corporations in the multinational group are more productive or efficient. Productivity and efficiency is unobserved firm specific effects that prior research has found to correlate with multi-nationality of firms (Mayer & Ottaviano, 2008), which will result in omitted variable bias in the nationality variable in OLS.

The sign of the FCC coefficient is negative as expected. OLS estimates the profitability differential between domestic Norwegian firms and Foreign controlled firms to be 1.18 percentage points (pp.). Fixed effects estimates that corporations which become foreign controlled suffer a fall in profitability of 1.09 pp. The difference between the OLS and fixed effects estimate is likely to be caused by a negative correlation between the unobserved firm specific effects and the foreignness of firms, suggesting that these firms are less productive or efficient. Given the estimated coefficients, it seems like foreign controlled corporations are less profitable than domestic Norwegian corporations, and this difference cannot be explained by either removing firm specific effects or my included control variables.

Table 8: Main Regression Results.

Variable	Coefficient	
	OLS	Fixed Effects
Norwegian Multinational (NMCs)	0.0147***	-0.0045
	(0.0033)	(0.0048)
Foreign Controlled (FCCs)	-0.0118***	-0.0109*
	(0.0025)	(0.0050)
Ownership Indicator	0.0106***	-0.0036
	(0.0024)	(0.0024)
Ownership Indicator$_{t-1}$	0.0061*	0.0047*
	(0.0024)	(0.0023)
Int. Bearing Debt / Tot. Capital	-0.2448***	-0.2128***
	(0.0026)	(0.0047)
Financial Income / Equity	0.9053***	0.6875***
	(0.2013)	(0.1690)
Tangible Assets / Assets	0.2506***	0.1180***
	(0.0089)	(0.0138)
Age Group 2	0.0080***	-0.1650***
	(0.0019)	(0.0005)
Age Group 3	0.0208***	-0.1326***
	(0.0019)	(0.0003)
Age Group 4	0.0342***	-0.1504***
	(0.0020)	(0.0003)
Sales 2 $_{t-1}$	0.0217***	-0.0042
	(0.0026)	(0.0034)
Sales 3 $_{t-1}$	-0.0191***	-0.0123***
	(0.0027)	(0.0037)
Sales 4 $_{t-1}$	-0.0318***	-0.0224***
	(0.0027)	(0.0039)
Sales 5 $_{t-1}$	-0.0353***	-0.0270***
	(0.0028)	(0.0043)
Constant	-0.1740	0.1795***
	(108.8189)	(0.0140)
Year dummies	Yes	Yes
Sector dummies (3 digit NACE)	Yes	No[5]
adj. R^2	0.186	0.027
Reference group	DNC	DNC
N	315 019	318 490

Robust Standard errors corrected for clustering in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[5] Sector dummies are not included in fixed effects as firm specific effects will capture the effect of sector.

The ownership variable which indicates if the chairman of the board also is employed in the same corporations is positive as expected, and significant in its current and lagged form in OLS. It is only significant when lagged once in fixed effects. This does indicate that corporations where the chairman of the board is employed in the same corporation are more profitable than corporations with professional leadership. It also does suggest that the effect of the variable is slightly delayed. OLS suggests that profitability in corporations where the CoB was employed as CEO the previous year is 0.61 pp. higher than in other corporations, and 1.06 pp. higher than in other corporations if the CoB is the current CEO. Fixed effects estimate that corporations where the CoB becomes the CEO experience an increase in profitability of 0.47 pp. the following year. Similar to the coefficient of the Norwegian multinational variable, the coefficient of the ownership variable falls from between OLS and fixed effects, though only slightly for the lagged form. This suggests that firm specific effects are positively correlated with the ownership variable, or that firms where the CoB is employed possibly are more productive or efficient than comparable corporations with professional management.

Among the other control variables, coefficients signs and sizes are mostly as expected. Profitability falls with increased debt, and increases with financial income. The coefficient for the financial income to equity ratio is positive and significant. A change to this ratio should convert into a higher profitability, as all else equal, a higher financial income should increase taxable income. Financial income has a rather large coefficient of around 90.53 %. in OLS, and 68.75 %. in the fixed effects estimation. The large coefficient can be explained by the fact that the denominator is equity, and not income.

Profitability increases with the tangibility ratio which is tangible assets in relation to total assets. The interpretation of this variable is a little difficult, as different guidelines and rules for intangibles exist for the corporations in the sample. If anything, one would expect profitability to increase with the amount of intangibles due to licensing fees and other income related to intangibles. The problem is that not every corporation recognize all intangibles in their balance sheet. The descriptive statistics do show that the average of this ratio is very high across all the groups. Only small changes are thus expected to the underlying ratio. The large drop in coefficient estimates between fixed effects and OLS do suggest that firm specific effects correlates positively with the tangibility ratio.

The age groups contain corporations grouped by age as described in section 4.3. These are significant and positive in OLS, which indicates that older corporations in general are more profitable. In fixed effects the signs of the age groups are negative. This does indicate that corporation which changes group as they become older become *less* profitable. One possible explanation to this is that the highest profitability levels are found early in the sample. Allowing some time for corporations to change their age group could lead to this variable capturing some of the effect which the year dummies were supposed to capture. It could also indicate that older corporations are less mobile with high levels of fixed costs, and that they are slow to adapt. See Figure 2 and Figure 3 in section 5.2 for the development in profitability over time.

It's a little bit different with the lag of sales groups, which are supposed to indicate size of corporations. The estimated coefficients for the lagged sales groups are negative in both OLS and fixed effects for groups 3 to 5, which indicate that larger corporations are less profitable. I am inclined to believe in the coefficients of the fixed effects estimation. Increasing sales is nearly always expensive. Given that a corporation expand and change sales group one year, it is plausible that it will have to increase costs or lower prices to maintain this position the following year. The OLS coefficients suggest that profitability peak in corporations belonging in sales group 2 and then decline throughout the following groups. I expected the opposite, that the larger corporations would be more profitable. Further, the difference in coefficients between OLS and fixed effects is positive for the second quintile and negative for the rest. The differences between OLS and fixed effects are also quite similar for the final three quintiles, suggesting the same level of productivity. Coefficients in OLS and fixed effects of the sales quintiles thus surprisingly suggest that corporations in the second quintile are the most efficient.

7.2 Comparison with previous studies

In this section I will compare my estimated coefficients with the results of Langli & Saudagaran (2004), Balsvik *et al.* (2009) and Tropina (2010). I will also attempt to isolate the effect of the change in tax regimes in 2006. It is most relevant to compare with the studies of Balsvik *et al.* (2009) and Tropina (2010) as both of these include a fixed effects estimation. Additionally, both papers separate between domestic and foreign multinational corporations. Langli & Saudagaran (2004) uses OLS on traditional industry and retail

sectors, but does only distinguish between Norwegian controlled and foreign controlled corporations. Their coefficient is thus likely to be influenced by the fact that Norwegian multinational corporations are left in the reference group when testing for differences. Table 9 displays the estimated coefficients for both the OLS and fixed effects estimation of the mentioned previous studies and the ones estimated in this thesis.

		OLS		FE	
	Coefficient	NMC	FCC	NMC	FCC
1	Langli & Saudagaran (2004)		-2.57		
2	Balsvik *et al.* (2009)	-1.44	-2.47	-1.14	-1.70
3	Tropina (2010)	-1.26	-3.43	-1.29	-1.97
4	My results (2013)	1.47	-1.18	-0.04	-1.09
5	Results without the ownership variable	1.16	-1.54	-0.04	-1.10
(5-2)	Difference Balsvik *et al.* (2009)	2.60	0.93	1.10	0.60
(5-3)	Difference Tropina (2010)	2.42	1.89	1.25	0.87

Table 9: Comparison of coefficients in selected previous studies.[6]
All estimates in percentage points.

My estimated coefficients are generally higher than those estimated in previous studies. The OLS estimate of Norwegian multinational corporations is also positive, which is opposite of what the other studies have found. It is in the coefficient for the foreign controlled corporations estimates vary most. My OLS estimated FCC coefficient of -1.18 pp. is just above 1/3 of the estimated coefficient by Tropina (2010). The OLS estimated FCC coefficient of Balsvik *et al.* (2009) and Langli & Saudagaran (2004) is closer, but still more than twice the size of my coefficient.

In fixed effects the differences between the estimated coefficients are smaller both for Norwegian multinational and foreign controlled corporations. Most notably, I find no differences in profitability between Norwegian multinational and domestic Norwegian corporations. Unlike in the previous studies, the fixed effects estimated coefficient of -0.04 pp. for Norwegian multinational corporations is insignificant. This could either indicate that Norwegian multinational corporations are less susceptible to profit shifting, or that they possibly profit shift to Norway.

[6] Tropina's results are found in table 6 on page 28 in Tropina (2010). Her DMNC and FMNC coefficients corresponds to my NMC and FCC coefficients. Balsvik *et al.* (2009) uses the same notation as Tropina (2010). Their results are found in table 8 on page 58 in Balsvik *et al.* (2009).

My estimated coefficient for the foreign controlled corporations is significant and closer to zero than previously found. The difference between the coefficients for this group in mine and previous studies is not as big as for the Norwegian multinational corporations, or those estimated by OLS. While being more in line with previous research, it still entertains the possibility that the profitability differential previously found has been influenced by the dual income tax system, and owners who receive wages as dividends.

Unfortunately I find similar coefficients when I leave the ownership variable out of the estimation[7]. This is slightly surprising considering the difference in profitability between corporations where the chairman of the board is CEO or not (See section 5.3 and attachment 1). I do observe changes to the coefficients in the OLS estimation. The ownership variable seems to have increased the difference in profitability between domestic Norwegian and Norwegian multinational corporations, while reducing the profitability difference between domestic Norwegian and foreign controlled corporations. Both nationality coefficients are near equal in the fixed effects estimation where the coefficient of the foreign controlled corporations falls by 0.01 pp. excluding the ownership indicator. This indicates that the ownership variable reduces the difference in profitability between domestic Norwegian and foreign controlled corporations, but only barely.

Obviously, it is only corporations who change nationality status which is counted in fixed effects. There are only 167 observations of corporations changing both ownership and nationality. By removing the ownership variable, the effect of change in ownership of these 167 observations is spread across other explanatory variables that ownership correlate with. The similar coefficients with and without the ownership variable in fixed effects seems thus to be caused by the fact that I have too few observations of corporations who change both nationality and ownership status.

A second explanation is that ownership does not influence profitability. Considering the descriptive statistics of section 5.3 I find this hard to believe. As I utilize data from after the tax regime change in 2006 however, it may have a weaker effect than it would under the dual income tax system which previous studies were carried out under. I don’t have data for the

[7] See attachment 2 for the regression output with the ownership variable omitted

period before 2006, thus it is not possible to estimate the effect of changing regimes, or the "difference in difference" by changing regimes.

As my coefficients estimated in fixed effects don't change much when leaving out the ownership variable, the difference in coefficients between those estimated in mine and those estimated in prior studies should mostly be attributed to the change in tax regimes. This difference in coefficients between mine and previous results could then be interpreted as an approximation for a difference-in-difference. Coefficients estimated by fixed effects suggests that limiting dividends under the new tax regime resulted in a reduction in the profitability difference between domestic Norwegian and Norwegian multinational corporations of between 1.10 pp. and 1.25 pp. Similarly, it led to a reduction in the profitability difference between domestic Norwegian and foreign controlled firms of between 0.60 pp. and 0.87 pp. There is no obvious reason to why the profitability difference between domestic Norwegian and Norwegian multinational corporations were reduced more than the difference in profitability between domestic Norwegian and foreign controlled corporations. Assuming that both groups of corporations have equal means and will to profit shift, it shouldn't be different. It could possibly indicate that the extent of profit shifting in foreign controlled corporations has increased, or the extent profit shifting to Norway by Norwegian multinational corporations has increased compared to previous studies. A second, but perhaps unlikely explanation could be that owners of Norwegian multinational corporations employed in the same corporation, received labour compensation as dividends to a larger extent than in domestic Norwegian corporations.

I find a smaller profitability differential between foreign and Norwegian firms compared to previous studies. Unlike previous studies, I find no difference between Norwegian multinational and domestic Norwegian corporations. The reason for this is probably both due to the introduction of the ownership variable, but also due to the change in tax regimes in 2006. Without comparable data before and after the change in tax regimes, finding the accurate effect of each is difficult. Still, the relative clear difference in coefficients between mine and previous studies suggest that these earlier studies may have been influenced by the fact that some owners chose to receive wages as dividends under the dual income tax system.

8. Robustness

In this section I will try to make small changes to either my variables or sample to check if my estimations are robust and valid even while using different assumptions. I will also try to find profitability differentials conditional on size and sector.

8.1 Size by sales quintiles

First I want to see if I can find differences in profitability conditional on the five size quintiles that I control for in the main regression, and also if introducing several more size quintiles improve the model in section 7. In table 10 below I've estimated the coefficient of Norwegian Multinational (NMC) and Foreign Controlled Corporations (FCC) individually by 5 quintiles of size, or sales. Significant coefficients are bolded. The difference in observations between the OLS and the FE estimation is due to missing variables for sector. Observations missing sector are dropped in the OLS estimation, but kept in the FE estimation.

Table 10: Norwegian Multinational and foreign controlled corporations by quintiles of sales.

	Sales 1		Sales 2		Sales 3		Sales 4		Sales 5	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
NMC	-0.0437	-0.0290	-0.0256	-0.0112	-0.0198	-0.0306	-0.0153	-0.00458	0.00486	-0.00253
	(0.0520)	(0.0502)	(0.0225)	(0.0220)	(0.0157)	(0.0207)	(0.0107)	(0.0127)	(0.00306)	(0.00496)
FCC	-0.0180	0.00712	0.00241	-0.00364	**-0.0310*** **	0.00508	**-0.0301*** **	-0.0137	**-0.0102*** **	-0.00853
	(0.0160)	(0.0336)	(0.0109)	(0.0188)	(0.00683)	(0.0170)	(0.00488)	(0.00808)	(0.00248)	(0.00555)
adj. R2	0.173	0.032	0.237	0.027	0.203	0.023	0.184	0.022	0.159	0.024
N	54 248	54 696	57 696	58 339	64 548	65 316	69 162	70 014	69 365	70 125
DNC	53 365	53 791	55 977	56 579	62 295	63 016	65 462	66 242	53 508	54 077
NMC	119	121	389	398	719	730	1 362	1 382	8 214	8 314
FCC	764	784	1 330	1 338	1 534	1 570	2 338	2 390	7 643	7 734

Robust Standard errors corrected for clustering in parentheses.
Industry is controlled for in OLS by 3 digit NACE codes.
All control variables included, but omitted from the table.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Tax planning and profit shifting is complex (Russo et al, 2007), which suggest that it is usually the larger corporations who have the means to do so. Additionally, there are generally fewer observations of foreign and multinational firms in the first two quintiles. Balsvik *et al.* (2009) do find significant differences for the FCC group in all sales quintiles in their OLS estimation, and in all but the first and last quintile using fixed effects. Tropina

(2010) finds the FMNC[8] variable significant in all sales quintiles in OLS, and in the final three quintiles using fixed effects. While their findings are in line with research about size and profit shifting, I see no such tendencies in my sample. I find no significant differences in fixed effects for any of the sales quintile. In OLS I find differences in the final three quintiles with the expected sign for foreign controlled corporations. The insignificance of fixed effects however suggests that all of these coefficients correlate with firm specific effects. This correlation seems negative for foreign controlled corporations and positive for Norwegian Multinational corporations in the final sales quintile, though this coefficient is insignificant in both OLS and fixed effects.

I have previously mentioned the weakness with using 5 quintiles of sale as a proxy for size. Especially, the results of 7.1 (Main Regression) is not quite as expected, seeing negative signs for the coefficient in nearly all five quintiles in both OLS and Fixed Effects. Additionally the sales spread in the final quintile was quite large. Using several more quintiles of sales seems to yield better results. Please see table 12 for the regression of profitability conditional on the lag of 20 sales quintiles. In this regression, the OLS estimation of the size quintiles has the expected positive sign, while the quintiles containing larger corporations are negative in fixed effects. Neither the nationality variables nor the other control variables change much between the regressions with 5 and 20 sales quintiles. The OLS estimation suggests that it is the corporations in the first eight quintiles which are the most profitable compared to the base which is the quintile with the least sales, though later quintiles are also more profitable. Though insignificant, this is reflected in the fixed effects estimation which indicate that corporations who change quintiles to one of the first eight quintiles become more profitable, while changes to any later quintile seems to be followed by a fall in profitability. This is plausible considering the cost of expansion.

Like in table 10, it does not seem like I find any differences estimated by fixed effects in profitability between the nationality groups when I estimate by 20 quintiles of sales instead of 5. These coefficients are displayed in attachment 3. I do however find several differences in OLS.

[8] Tropina's (2010) FMNC variable corresponds to my FCC variable.

Table 11: 20 Quintiles of Sales.

	OLS	FE
Norwegian Multinational Corporation	0.0161***	-0.0001
	(0.0034)	(0.0043)
Foreign Controlled Corporation	-0.0123***	-0.0114**
	(0.0025)	(0.0043)
Ownership Indicator	0.0075***	-0.0044*
	(0.0019)	(0.0019)
Ownership Indicator$_{t-1}$	0.0082***	0.0049**
	(0.0019)	(0.0019)
Int. Bearing Debt / Tot. Capital	-0.2445***	-0.2121***
	(0.0026)	(0.0046)
Financial Income / Equity	0.9052***	0.6903***
	(0.2006)	(0.1690)
Tangible Assets / Assets	0.2516***	0.1155***
	(0.0086)	(0.0135)
Age Group 2	0.0063***	-0.0410
	(0.0019)	(0.0463)
Age Group 3	0.0188***	-0.0714
	(0.0018)	(0.0491)
Age Group 4	0.0320***	-0.0264
	(0.0020)	(0.0463)
Sales 2 $_{t-1}$	0.0707***	0.0100
	(0.0054)	(0.0061)
Sales 3 $_{t-1}$	0.0883***	0.0090
	(0.0054)	(0.0069)
Sales 4 $_{t-1}$	0.1022***	0.0108
	(0.0053)	(0.0072)
Sales 5 $_{t-1}$	0.1115***	0.0113
	(0.0052)	(0.0073)
Sales 6 $_{t-1}$	0.1007***	0.0069
	(0.0051)	(0.0074)
Sales 7 $_{t-1}$	0.0805***	0.0009
	(0.0050)	(0.0073)
Sales 8 $_{t-1}$	0.0628***	0.0015
	(0.0049)	(0.0073)
Sales 9 $_{t-1}$	0.0561***	-0.0009
	(0.0049)	(0.0073)
Sales 10 $_{t-1}$	0.0513***	-0.0034
	(0.0049)	(0.0073)
Sales 11 $_{t-1}$	0.0444***	-0.0087
	(0.0048)	(0.0073)
Sales 12 $_{t-1}$	0.0422***	-0.0104
	(0.0048)	(0.0074)
Sales 13 $_{t-1}$	0.0374***	-0.0157*
	(0.0048)	(0.0074)
Sales 14 $_{t-1}$	0.0362***	-0.0194**
	(0.0048)	(0.0074)
Sales 15 $_{t-1}$	0.0337***	-0.0235**
	(0.0048)	(0.0075)
Sales 16 $_{t-1}$	0.0328***	-0.0240**
	(0.0048)	(0.0076)
Sales 17 $_{t-1}$	0.0352***	-0.0267***
	(0.0048)	(0.0077)
Sales 18 $_{t-1}$	0.0314***	-0.0290***
	(0.0048)	(0.0079)
Sales 19 $_{t-1}$	0.0273***	-0.0293***
	(0.0049)	(0.0081)
Sales 20 $_{t-1}$	0.0325***	-0.0249**
	(0.0051)	(0.0085)
_cons	-0.1569***	0.0882*
	(0.0105)	(0.0388)
adj. R^2	0.191	0.028
N	323357	326837

Robust standard errors in parentheses. Sector and year controlled for with dummies where appropriate.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

8.2 Estimation by sectors

In table 12.1 to table 12.4 I have estimated the profitability difference between domestic Norwegian and foreign controlled corporations, and also between domestic and Norwegian multinational corporations by sectors according to the 2007 NACE Standard.[9]

Like in the previous studies of Balsvik *et al.* (2009) and Tropina (2010) I do find differences in several sectors, though unfortunately not in many. The coefficients found in this study are not directly comparable to those estimated in previous studies, as I distinguish between more sectors. Surprisingly, I notice that foreign corporations in the primary sector are *more* profitable than Norwegian corporations. Foreign controlled corporations are estimated to be 16 pp. more profitable than Norwegian corporations in OLS. The coefficient for Norwegian multinationals is 10.9 pp., though this coefficient is insignificant. I find no significant sizes in the fixed effects estimation. There are few observations of foreign and multinational firms in this sector, which may cause the high coefficients in OLS. I find no significant differences in the manufacturing, electrical or water supply and renovation sectors.

In the construction sector I find the estimated coefficients to have the expected sign. The OLS estimation does indicate that foreign controlled corporations on average are 2.02 pp. less profitable than domestic Norwegian corporations. Norwegian multinational corporations have the opposite, positive sign, but it is insignificant. I find no differences in the automotive and trade (which includes retail and wholesale) sectors, while I again find a positive OLS coefficient for Norwegian multinationals in the transportation and storage sectors. Norwegian multinationals are seemingly more profitable than domestic Norwegian corporations in this sector, but that could be explained by efficiency differences in the firm specific effects correlating with the nationality variable.

I find the first significant difference in fixed effects in the Hotels and Restaurant sector. Corporations that become foreign controlled suffer a fall in profitability of 8.92 pp. This coefficient is indeed rather large, and may be caused by the relatively few observations of foreign firms in this sector. Further, I find no differences in the IT & Communications or Finance & Insurance sector. Previous literature has previously found the larger differences to

[9] See http://www4.ssb.no/stabas/ClassificationFrames.asp?ID=342101&Language=nb for the breakdown of sectors in the 2007 NACE Standard.

exists in the finance sector, but I am unable to find any significant differences in this sector. I do find significant sizes in the real estate sector in OLS, but as these are insignificant in the fixed effects estimation firm specific effects may be at cause.

Table 12.1: Regression by sectors – Significant sizes bolded.

	Primary Sector		Manufacturing		El-Supply		Water & Renovation	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
NMC	0.0109	0.0318	0.0002	-0.0058	0.0520	-0.0160	0.0214	0.0053
	(0.0152)	(0.0328)	(0.0061)	(0.0100)	(0.0277)	(0.0293)	(0.0154)	(0.0354)
FCC	**0.160****	0.0655	0.0041	-0.0102	-0.0266	-0.0334	-0.0252	-0.0646
	(0.0590)	(0.0532)	(0.007)	(0.0113)	(0.0575)	(0.0939)	(0.0254)	(0.216)
adj. R2	0.090	0.054	0.099	0.039	0.071	0.029	0.099	0.044
N	6 552	6 552	22 783	22 783	2 127	2 127	1 482	1 482
DNC	6 220		19 739		1 642		1 271	
NMC	268		1 671		433		146	
FCC	64		1 373		52		65	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12.2: Regression by sectors – Significant sizes bolded.

	Construction		Automotive/Trade		Transportation/Storage		Hotels/Restaurants	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
NMC	0.0191	-0.0049	-0.00443	-0.0059	**0.0424*****	0.0038	-0.0284	-0.0109
	(0.0101)	(0.0155)	(0.0038)	(0.0065)	(0.0107)	(0.0241)	(0.0145)	(0.0141)
FCC	**-0.0202***	-0.0134	0.0042	-0.0026	-0.0146	-0.0328	-0.0294	**-0.0892***
	(0.0085)	(0.0138)	(0.003)	(0.0076)	(0.0088)	(0.0293)	(0.0191)	(0.0451)
adj. R2	0.072	0.049	0.074	0.020	0.080	0.030	0.108	0.050
N	41 991	41 991	73 895	73 895	13 512	13 512	10 136	10136
DNC	40 468		66 823		11 933		9 754	
NMC	839		2 116		830		249	
FCC	684		4 956		749		133	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12.3: Regression by sectors – Significant sizes bolded.

	IT & Com.		Finance/Insurance		Real Estate		Service (Educated)	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE
NMC	0.0153	0.0050	0.0093	0.104	**0.0492*****	-0.0099	-0.0037	0.0038
	(0.0124)	(0.0167)	(0.0349)	(0.0764)	(0.0098)	(0.0120)	(0.0159)	(0.0255)
FCC	-0.0053	-0.006	-0.0268	-0.0457	**-0.0261***	0.0047	-0.0014	**-0.0346***
	(0.0087)	(0.0140)	(0.0308)	(0.0404)	(0.0121)	(0.0154)	(0.0089)	(0.0164)
adj. R2	0.135	0.024	0.133	0.032	0.169	0.035	0.148	0.019
N	11 111	11 111	3 568	3 568	70 582	70 582	26 936	26 936
DNC	9 275		3 484		66 929		25 107	
NMC	609		198		2 441		443	
FCC	1 227		186		1 212		1 386	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 12.4: Regression by sectors – Significant sizes bolded.

	Service (Un.)		Education		Health		Culture		Service (Other)	
	OLS	FE	OLS	FE	OLS	FE	OLS	FE	OLS	FE
NMC	**0.0698*** **	0.0145	-0.0001	0.0270	-0.0223	**-0.0737*** **	-0.0102	-0.0597	0.0507	-0.00843
	(0.0160)	(0.0202)	(0.0314)	(0.0467)	(0.0219)	(0.0181)	(0.108)	(0.0380)	(0.0541)	(0.0382)
FCC	-0.0002	0.0083	0.0064	0.0184	-0.0374	**-0.0531*** **	-0.0105	0.0119	0.0240	**0.0670***
	(0.0092)	(0.0202)	(0.0377)	(0.0490)	(0.0210)	(0.0130)	(0.0321)	(0.0193)	(0.0305)	(0.0327)
adj. R2	0.078	0.025	0.167	0.036	0.230	0.038	0.131	0.015	0.078	0.020
N	11 578	11 578	2 185	2 185	9 829	9 829	3 158	3 158	3 513	3 513
DNC	10 140		2 105		9 482		3 011		3 446	
NMC	454		7		53		25		19	
FCC	984		73		294		122		48	

Standard errors in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In the professional service sector, foreign controlled corporations have a lower estimated profitability in fixed effects. The estimation suggests that profitability in corporations in this sector falls with 3.46 pp. when the corporation becomes foreign controlled. In the OLS estimation this coefficient is insignificant, but that could be due to the firm specific effects biasing this coefficient positively. In the uneducated service sector I find no differences in fixed effects, but the OLS estimates suggests that Norwegian multinational corporations are more profitable. This is not necessarily true, as again the insignificance of fixed effects suggests a correlation of firm specific effects with the multi-nationality variable. I find no differences in the education or culture sectors.

I find one of the largest negative profitability differences in the health sector. None of the OLS estimates are significant, but fixed effects estimates a fall in profitability of 7.37 pp. for corporations which become multinational. Corporations that become foreign controlled suffer a similar, but not as large fall in profitability. The estimated difference for this group is 5.31 pp. Though perhaps a little ironic that it is the iconic health sector which is found to have such a large profitability differential between Norwegian and Norwegian multinational or foreign firms, it's not very surprising. The sector is very intangible assets and specialized equipment intensive. This allows managers discretion to subjectively value licensed IP and traded specialized equipment, which makes it possible to easily profit shift across borders.

The final significant estimated size is found in the final service sector. A little surprisingly, it seems like corporations that become foreign controlled increases their profitability with 6.7 pp. Do note the few observations of foreign firms in this sector though, which likely influences the estimates.

To summarize, I do find several significant differences across sectors, though in several sectors I find that multinational corporations has a positive sign in OLS. This is most likely due to the presence of firm specific effects that affects profitability positively, and which correlates positively with the multinational variable. I find negative differences in profitability in fixed effects in the Hotels & Restaurants, Professional Service and Health sectors. Do however take into consideration that few observations of foreign and Norwegian multinational firms may cause the significance of these coefficients. Compared to previous literature, I find lower profitability differences in fewer sectors. This is likely due to a number of reasons. The unobserved profitability differential between Norwegian, Norwegian multinational and foreign firms may have been reduced due to the change in tax regime and the addition of the ownership indicator. Authors of previous studies have also had more observations over a longer period of time available. I also distinguish between more sectors.

8.3 Profitability measurements / Dependent variable

It is quite common in previous literature to test different profitability measurements. Unfortunately, as the dataset I have was constructed for my purposes it is very specialized, and there are few denominators for taxable income to choose from. The alternative denominators I can utilize are assets/total capital or equity, which also are utilized in previous studies.

The findings in the descriptive statistics in section 5.1 indicate that both asset and equity will perform badly as denominator in the dependent variable. Also, both denominators are already used in the explanatory variables, so the results may become spurious by introducing the same denominator in the dependent variable (Kronmal, 1993). For the complete estimation of both denominators please consult attachment 4 (Assets/Total Capital) and 5 (Equity).

Using assets/total capital as denominator for the dependent variable causes in general the estimated nationality coefficients to become higher in absolute value, and both have the expected negative sign. The OLS estimation of the NMC coefficient is -1.27 pp., while the FCC coefficient is estimated to be -1.33 pp. In fixed effects, the NMC indicator has a negative coefficient of 2.68 pp., while the FCC indicators value is quite similar at -2.70 pp. Both nationality variables increase in absolute value compared to the main estimation in section 7.1 where taxable income to sales income was used as profitability measure. This is

likely due to the fact that the ownership variable becomes insignificant in the estimation with total capital as denominator for taxable income. The similarity of the FCC and NMC coefficients is likely a result of the relative higher level of assets for the Norwegian multinational corporations, which is probably caused by the fact that Norwegian multinational carriers the value of affiliates in their balance sheet. For this reason, it is not possible to compare Norwegian multinational corporations and domestic Norwegian corporations. Further, it is slightly surprising how weakly significant financial income is in OLS. In fixed effects, the estimated coefficient for financial income is insignificant. The sales groups do get the expected positive sign in OLS and the expected negative sign in fixed effects.

Using equity as denominator should according to Balsvik *et al.* (2009), "*work best".* In my estimation, it doesn't. Nearly every coefficient loses significance when I use taxable income over equity as dependent variable. Not even the nationality indicators are significant. The adjusted R square of the model is 0. Apparently, using equity as a denominator doesn't reveal much, except perhaps that my explanatory variables do not substantially affect the taxable income to equity ratio. There are several reasons which may explain this. The most likely however is that the spread in this ratio is probably much larger in the taxable income to equity than the taxable income to turnover ratio, which should lie between -1 and 1. This is also as suggested by descriptive statistics in section 5.1. Theoretically, corporations can get away with very low levels of equity and rather finance by debt. This means that some corporations with very low equity and high debt may have substantially high pre-tax income, even after interest costs.

8.4 Sample selection

Running the estimation on the whole sample gives no comprehensible answer. The adjusted R Square is 0, and no variable is significant. This may be due to several reasons, but the most likely is including the small corporations with assets less than one million NOK, of which there are about 400 000 observations of in a total sample size of 1.2 million. Additionally, several corporations with income less than zero are included, and influence the coefficients. When the spread and the number of extreme values increases, it is more difficult to estimate significant coefficients.

In the main regression I drop observations of firm who changes status in either nationality or ownership more than once. I suspect the reason for the multiple changes is a result of misspecification. It is however possible that these changes are real changes. For this reason I run the estimation again with the previously dropped observations included. This regression output can be found in attachment 6. I find quite similar nationality coefficients in this regression compared to the main regression in section 7. Additionally, the current ownership coefficient becomes significant and negative in fixed effects, while the lagged coefficient retains it sign and decrease slightly in value. In the OLS estimation both are positive and significant. If the multiple changes were a result of misspecification, I would expect a lower significance the ownership variables, but the opposite is actually true. The negative coefficient of the current ownership variable is not as expected, but it could indicate that the chairman of the board assume control of corporations performing badly. Multiple changes in nationality and ownership do not however seem to overly influence the nationality variables, left out or included.

I also restrict the sample further. The most logical further restriction is to delete every observation where the asset side and the equity and debt side of the balance sheet do not match. However, by doing so I only have just over 108 000 observations left to run the estimations on. This regression output can be found in attachment 7. The nationality variables become insignificant, and several of the sector and age groups are dropped because of collinearity.

8.5 Summary of Robustness

I find no clear differences in profitability between foreign controlled and Norwegian multinational corporations compared to domestic Norwegian corporations conditional on the sales quintiles, even when using 20 quintiles of sales instead of the 5 commonly utilized in previous studies. However, it seems like the main estimation results become more in line with economic theory and expectations by using 20 quintiles of sales rather than just 5. The reason for this is probably due to the extreme spread of income in the final sales quintile when only utilizing five quintiles. The coefficients of the nationality variables and the ownership indicator do not change much between the regressions with 5 and 20 quintiles of sales. Further, I do find that the profitability differential is sector dependent. I only find few profitability differences when estimating by sector in fixed effects compared to previous

studies. This is likely due to both the fact that my ownership indicator now captures some of the effect of the profitability differential between domestic Norwegian and international firms, but also due to the fact that my dataset covers a shorter period of time than found in previous studies.

As the descriptive statistics in 5.1 suggest, neither the taxable income to assets ratio nor taxable income to equity ratio seem to function as profitability measurements or as dependent variables in my estimation. Despite this I find significant differences in profitability between the nationality groups in fixed effects when using assets as denominator for taxable income. The negative and significant coefficients for Norwegian multinationals are not surprising, as these corporations carry the value of affiliates in their balance sheet. The fact that the income to equity ratio has found to be working well in previous studies surprises me. One possible explanation to why it doesn't in my estimation is that the extent of leasing, renting and gearing has increased between the years, which allows corporation to function without a high amount of assets or equity.

Including small, Norwegian corporations of assets of less than 1 million NOK and corporations with negative income presents some problems, as all my variables become insignificant. This is due to the fact that the sample is less homogenous, and come as no surprise. The results are similar when I exclude all corporations where the asset and debt & equity sides of the balance sheet do not match. I end up with too few observations to find significant sizes in fixed effects.

The nationality coefficients do not change much by including the relatively few observations of corporations who change nationality or ownership status twice or more. They do however affect the ownership indicator, which become negative in its current form. This does indicate that corporations where the chairman of the board assume control is less profitable, but it may also be due to simple measurement error. Lagged once, the ownership indicator retains it positive sign and significance.

None of the above makes me doubt my main estimated coefficients for the nationality variables, which signs and coefficients are plausible and easily can be explained. Yes, the estimated nationality and the ownership indicator change substantially by using a different profitability measurement, which it should as it doesn't measure the taxable income to sales ratio anymore, but rather return on assets and equity.

9. Conclusion

In this thesis, I have tried to estimate the unobserved difference in profitability between Norwegian and international firms under the 2006 tax regime in Norway. I suspect that the result of previous studies on the subject in Norway may be affected by the fact that under some circumstances under the pre 2006 tax regime, it would be profitable for owners who were employed in the corporation they owned to receive wages as dividends rather than personal income. In such cases, the profitability of the corporation would increase; less wages were paid which would increase profits before taxes. In order to answer the hypotheses presented in section 3, I use both a descriptive and an empirical analysis.

In the descriptive analysis I find a relatively clear unconditional difference between domestic Norwegian and foreign controlled corporations. There also seems to be a difference between domestic and Norwegian multinational corporations, though this difference is not as large as the one between foreign controlled and domestic Norwegian firms. I further find that the profitability of foreign firms were more stable throughout the financial crisis, which indicate that these corporations have a higher degree of flexible costs than Norwegian firms. Profitability seems to depend on ownership, as I find a higher profitability in corporations where the chairman of the board is the same person as the CEO. This is especially true in Norwegian corporations. Though dividends at a low tax rate were limited in the 2006 tax reforms act, there are still incentives to receive at least some of the compensation as dividends rather than personal income.

In the empirical analysis I try to estimate the profitability difference between both domestic Norwegian and Norwegian multinational corporations, and domestic Norwegian and foreign controlled firms conditional on a set of explanatory variables. I control for ownership by introducing a variable which indicates where a corporations' chairman of the board also is the CEO. This variable is supposed to capture the effect of wages as dividends. I also introduce control variables typically found in financial statements, and I use the lag of sales as a proxy for the corporation size. Conditional on my explanatory variables and after controlling for fixed effects I find no differences between Norwegian and Norwegian multinational corporations. I do however find a slight difference between foreign controlled and domestic Norwegian corporations. The ownership variable is significant lagged once, with a positive sign which indicates that the effect of ownership might be delayed.

To answer the hypotheses in section 3, based on the empirical analysis I find that ownership influences profitability positively. The lag of this variable has a positive coefficient of 0.47 pp. I find a lower profitability in foreign controlled firms compared to Norwegian firms, the difference between these groups is 1.09 percentage points estimated in fixed effects. I do not find a similar difference between domestic Norwegian and Norwegian multinational firms. The null of [H1] and [H2] are thus rejected, while I keep the null of [H3].

Though some foreign firms probably do shift profits away from Norway, it is impossible to indicate to which extent the estimated difference in profitability between foreign controlled and domestic Norwegian corporations is a result of profit shifting. The estimated difference in profitability between domestic Norwegian and foreign firms of 1.09 pp. must be interpreted as the maximum level of profit shifting. I find no differences in profitability between domestic Norwegian and Norwegian multinational corporations. As I assume that Norwegian owners are no less susceptible to profit shifting than foreign owners, this could be explained by the fact that for some corporations, Norway is a low tax country. These corporations would thus rather profit shift to Norway, rather than away from it.

Compared to previous studies, I find smaller differences between domestic Norwegian and foreign controlled firms. Unlike previously found, I find no differences between domestic Norwegian and Norwegian multinational corporations. This is probably due to both the inclusion of the ownership variable, but also due to the change in tax regimes in 2006. My estimated results suggest that previous studies have been influenced by the fact that some owners chose to receive compensation as dividends instead of personal income. Changing profitability measurement to return on assets, I find a lower profitability in both multinational and foreign controlled corporations compared to the domestic Norwegian corporations.

For future research on the same subject, I would suggest using different controls for size. Perhaps number of employees could be a good indicator. Further, including the sizes dividends and wages could possibly answer how much dividends active owner chose to receive as opposed to wages. However, I still believe the most important thing is the quality of the dataset, number of observations and number of observed years since 2006. With the quality of the data from the Norwegian Tax Administration it should be simple to identify clearer differences as the number of observations grows.

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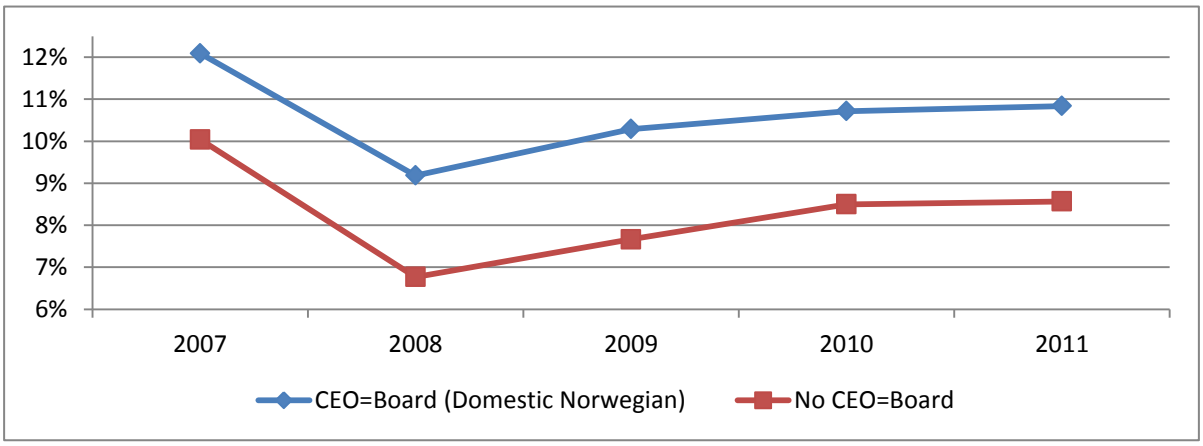
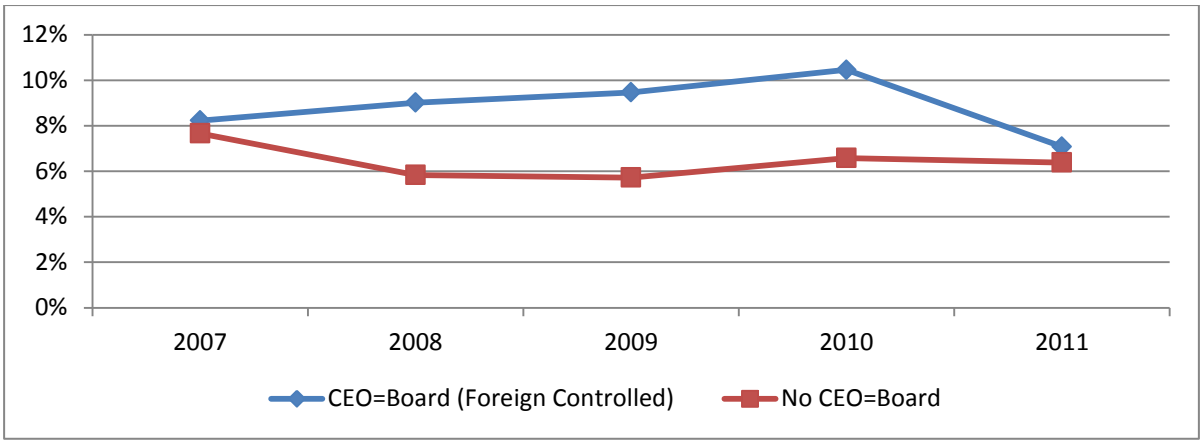
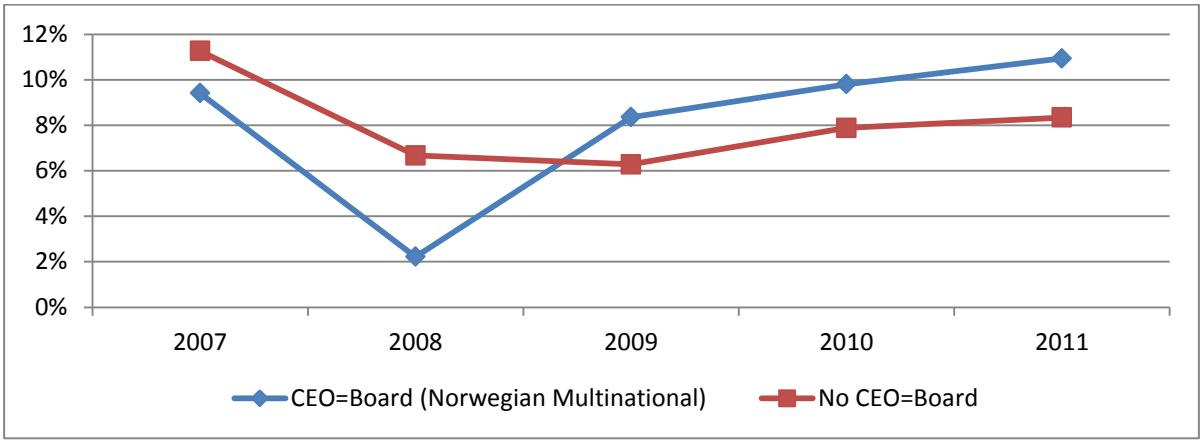
11. Attachments

Attachment 1: Profitability conditional on the ownership statistics by nationality of Firms.







Attachment 2: Ownership indicator omitted

	OLS	FE
Norwegian Multinational Corporations	0.0116***	-0.00450
	(0.00329)	(0.00482)
Foreign Controlled Corporations	-0.0154***	-0.0110*
	(0.00253)	(0.00498)
Int. Bearing Debt / Tot. Capital	-0.245***	-0.213***
	(0.00259)	(0.00473)
Financial Income / Equity	0.908***	0.687***
	(0.202)	(0.169)
Tangible Assets / Assets	0.254***	0.118***
	(0.00894)	(0.0138)
Age Group 2	0.00851***	-0.165***
	(0.00191)	(0.000528)
Age Group 3	0.0214***	-0.133***
	(0.00187)	(0.000334)
Age Group 4	0.0352***	-0.150***
	(0.00199)	(0.000334)
Sales 2_{t-1}	0.0211***	-0.00419
	(0.00261)	(0.00340)
Sales 3_{t-1}	-0.0210***	-0.0124***
	(0.00266)	(0.00370)
Sales 4_{t-1}	-0.0350***	-0.0225***
	(0.00265)	(0.00391)
Sales 5_{t-1}	-0.0406***	-0.0270***
	(0.00273)	(0.00429)
Constant	-0.166	0.180***
	(117.9)	(0.0139)
adj. R^2	0.185	0.027
N	315 019	318 490

Robust standard errors in parentheses. Sector and year controlled for with dummies where appropriate.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Attachment 3: Nationality coefficients by 20 quintiles of sales.

	OLS		FE	
	Nationality Coefficients			
Quintile	NMC	FCC	NMC	FCC
1	-0.0347	0.0379	-0.1264	-0.0156
2	0.0985	-0.0701*	0.0352	-0.0610
3	-0.0630	-0.0379	-0.0628	0.0987
4	-0.1640*	-0.0043	-0.0474	0.0443
5	0.0017	0.0094	-0.0784	0.0551
6	-0.0363	-0.0082	-0.0452	0.0144
7	-0.0600	-0.0273	-0.0305	-0.0097
8	-0.0217	0.0246	0.0036	-0.0284
9	-0.0162	-0.0413**	-0.0975*	0.0082
10	-0.0479	-0.0312*	-0.0157	-0.0215
11	-0.0434	-0.0361**	-0.0826	-0.0010
12	0.0160	-0.0267*	0.0292	-0.0362
13	-0.0756**	-0.0299**	-0.0186	0.0254
14	-0.0145	-0.0218*	0.0301	-0.0054
15	0.0069	-0.0215**	0.0005	-0.0212
16	-0.0021	-0.0409***	-0.0197	-0.0243
17	0.0292*	-0.0219**	0.0060	-0.0109
18	-0.0124	-0.0157**	-0.0005	-0.0175
19	-0.0066	-0.0222***	-0.0031	-0.0117
20	0.0093**	-0.0028	-0.0014	-0.0111

$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Attachment 4: Assets/Total Capital as denominator in dependent variable

	OLS	FE
Norwegian Multinational Corporations	-0.0127*	-0.0133**
	(0.00536)	(0.00490)
Foreign Controlled Corporations	-0.0268***	-0.0270***
	(0.00321)	(0.00538)
Ownership Indicator	0.0145*	0.00617
	(0.00720)	(0.0105)
Ownership Indicator$_{t-1}$	0.00421	0.00154
	(0.00680)	(0.00444)
Int. Bearing Debt / Tot. Capital	-0.201***	-0.265***
	(0.00251)	(0.00797)
Financial Income / Equity	0.550*	0.202
	(0.216)	(0.219)
Tangible Assets / Assets	0.342***	0.164***
	(0.0122)	(0.0220)
Age Group 2	-0.0000248	-0.0756***
	(0.00221)	(0.000893)
Age Group 3	-0.00232	-0.00253***
	(0.00231)	(0.000567)
Age Group 4	-0.00646**	-0.0484***
	(0.00229)	(0.000567)
Sales 2$_{t-1}$	0.0236***	-0.00632**
	(0.00119)	(0.00206)
Sales 3 $_{t-1}$	0.0162***	-0.0213***
	(0.00146)	(0.00278)
Sales 4 $_{t-1}$	0.0151***	-0.0420***
	(0.00162)	(0.00343)
Sales 5 $_{t-1}$	0.0332***	-0.0514***
	(0.00187)	(0.00451)
Constant	-0.211	0.0564*
	(76.71)	(0.0221)
adj. R^2	0.123	0.028
N	315 019	318 490

Robust standard errors in parentheses. Sector and year controlled for with dummies where appropriate.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Attachment 5: Equity as denominator in dependent variable

	OLS	FE
Norwegian Multinational Corporations	-0.300	-0.498
	(0.219)	(0.622)
Foreign Controlled Corporations	0.0349	-0.265
	(0.196)	(0.278)
Ownership Indicator	-0.0157	0.248
	(0.181)	(0.251)
Ownership Indicator$_{t-1}$	-0.301	-0.527
	(0.164)	(0.278)
Int. Bearing Debt / Tot. Capital	-0.304	-0.915
	(0.271)	(0.988)
Financial Income / Equity	29.83	34.00
	(57.77)	(72.27)
Tangible Assets / Assets	2.811**	-7.227
	(0.884)	(9.798)
Age Group 2	0.163	-0.358**
	(0.424)	(0.123)
Age Group 3	-0.144	0.0622
	(0.250)	(0.0832)
Age Group 4	-0.0793	-0.293***
	(0.271)	(0.0832)
Sales 2 $_{t-1}$	0.0440	0.609
	(0.235)	(0.512)
Sales 3 $_{t-1}$	0.314	0.577
	(0.300)	(0.382)
Sales 4 $_{t-1}$	0.484	0.926*
	(0.299)	(0.457)
Sales 5 $_{t-1}$	0.208	0.880
	(0.257)	(0.491)
Constant	-2.066	7.515
	(.)	(9.687)
adj. R^2	0.001	-0.000
N	315 019	318 490

Robust standard errors in parentheses. Sector and year controlled for with dummies where appropriate.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Attachment 6: Multiple status changes included

	OLS	FE
Norwegian Multinational Corporations	0.0145***	-0.0003
	(0.0032)	(0.0043)
Foreign Controlled Corporations	-0.0129***	-0.0119**
	(0.0024)	(0.0043)
Ownership Indicator	0.0081***	-0.0043*
	(0.0019)	(0.0019)
Ownership Indicator$_{t-1}$	0.0087***	0.0051**
	(0.0019)	(0.0019)
Int. Bearing Debt / Tot. Capital	-0.2433***	-0.2118***
	(0.0025)	(0.0046)
Financial Income / Equity	0.9108***	0.6924***
	(0.2013)	(0.1690)
Tangible Assets / Assets	0.2524***	0.1144***
	(0.0086)	(0.0135)
Age Group 2	0.0055**	-0.0433
	(0.0019)	(0.0460)
Age Group 3	0.0179***	-0.0717
	(0.0018)	(0.0488)
Age Group 4	0.0311***	-0.0287
	(0.0020)	(0.0460)
Sales 2 $_{t-1}$	-0.0800***	Omitted
	(0.0038)	
Sales 3 $_{t-1}$	-0.0386***	-0.0052
	(0.0022)	(0.0057)
Sales 4 $_{t-1}$	-0.0629***	-0.0179**
	(0.0022)	(0.0058)
Sales 5 $_{t-1}$	-0.0610***	0.0895*
	(0.0096)	(0.0384)
Constant	0.189	0.028
	323357	326837
adj. R^2	0.0145***	-0.0003
N	(0.0032)	(0.0043)

Robust standard errors in parentheses. Sector and year controlled for with dummies where appropriate.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Attachment 7: Sample further restricted

	OLS	FE
Norwegian Multinational Corporations	0.0095	-0.0139
	(0.0052)	(0.0105)
Foreign Controlled Corporations	-0.0091*	-0.0145
	(0.0042)	(0.0103)
Ownership Indicator	0.0031	-0.0043
	(0.0045)	(0.0056)
Ownership Indicator$_{t-1}$	0.0151***	0.0089
	(0.0044)	(0.0052)
Int. Bearing Debt / Tot. Capital	-0.2870***	-0.2374***
	(0.0042)	(0.0107)
Financial Income / Equity	0.9640**	0.5413*
	(0.3534)	(0.2234)
Tangible Assets / Assets	0.2441***	0.0968**
	(0.0145)	(0.0326)
Age Group 2	0.0065*	Omitted
	(0.0032)	
Age Group 3	0.0208***	-0.1308***
	(0.0032)	(0.0008)
Age Group 4	0.0370***	Omitted
	(0.0034)	
Sales 2 $_{t-1}$	0.0401***	-0.0151*
	(0.0041)	(0.0070)
Sales 3 $_{t-1}$	-0.0172***	-0.0285***
	(0.0043)	(0.0078)
Sales 4 $_{t-1}$	-0.0353***	-0.0392***
	(0.0043)	(0.0085)
Sales 5 $_{t-1}$	-0.0435***	-0.0484***
	(0.0045)	(0.0091)
Constant	-0.2555***	0.1558***
	(0.0153)	(0.0331)
adj. R^2	0.206	0.027
N	108 718	109 871

Robust standard errors in parentheses. Sector and year controlled for with dummies where appropriate.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$